



United States  
Department of  
Agriculture



NRCS

Natural  
Resources  
Conservation  
Service

In cooperation with  
the Oklahoma Agricultural  
Experiment Station and  
the Oklahoma  
Conservation Commission

# Soil Survey of Harper County, Oklahoma







# How To Use This Soil Survey

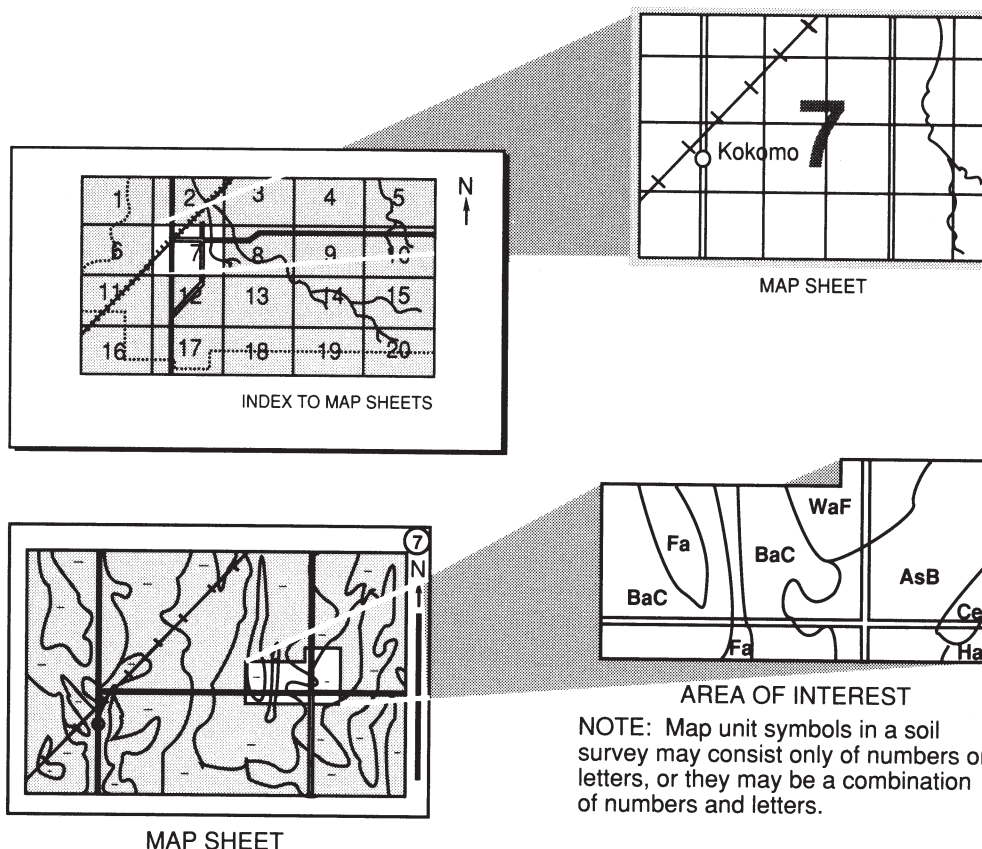
## Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



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This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1996. Soil names and descriptions were approved in July 1998. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1996. This survey was made cooperatively by the Natural Resources Conservation Service, the Oklahoma Agricultural Experiment Station, and the Oklahoma Conservation Commission. It is part of the technical assistance furnished to the Harper County Conservation District.

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**Cover: A Permian red bed escarpment overlooking the Cimarron river valley in the northwest part of Harper County known as "Ditch Valley."**

*Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at <http://www.nrcs.usda.gov>.*

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## Foreword

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This soil survey contains information that can be used in land-planning programs in Oklahoma. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information is available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.



M. Darrel Dominick  
State Conservationist  
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# Soil Survey of Harper County, Oklahoma

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Fieldwork by Troy Collier and Steve Alspach, Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service,  
in cooperation with  
the Oklahoma Agricultural Experiment Station and the Oklahoma Conservation  
Commission

## General Nature of the Survey Area

HARPER COUNTY is in the northwestern part of Oklahoma (fig. 1). This soil survey updates the survey of Harper County published in 1960. It provides additional information and shows the soils in greater detail.

## History

Harper County was originally part of the Cherokee Outlet, which was established in 1834. The United States Government took the lands of the Cherokee Outlet from the Cherokee Tribe as a penalty for siding with the South in the Civil War. The Cherokee Outlet was opened for settlement on September 16, 1893. The settlement opening was called The Land Run. Each settler received 160 acres of land as provided by the Homestead Act of 1893. The early settlers endured many hardships, and most lived in sod houses.

Two major trails crossed Harper County. The Fort Dodge to Camp Supply Military Trail and the Western Cattle Trail (or Dodge City Trail). The Military Trail was first



Figure 1.—Location of Harper County in Oklahoma.

opened on November 12, 1868. The 7th Cavalry marched from Fort Dodge with 1,100 men and 400 wagons to set up Camp Supply. The Military Trail and the Western Trail were joined from Fort Dodge to the Cimarron River. The Military Trail split off south of the Cimarron River and crossed into Harper County just 1 mile west of the Willard School. The trail then proceeded to Buffalo and south to Camp Supply. The Western Cattle Trail started in 1874 when railroads reached Dodge City. Cattle were driven out of western Texas through Harper County just west of May, Oklahoma, and crossed into Kansas about 3 miles west of the Willard School.

Until statehood, the major crops grown in Harper County were broomcorn, sorghum, corn, kafir, and alfalfa. Broomcorn was the major cash crop. Wheat was established around 1894 but was not grown on a large scale until about 10 years later. "Because most of the settlers had large families, they had to plow much of the marginal land to gain a livelihood. For a long time, greater returns were expected from the land than it was capable of producing. As the productivity of the soils declined and as the hazards of droughts and erosion became greater, the population of the county became smaller and larger farms were needed to provide a living for the farm families" (USDA-SCS, 1960). Irrigation of cropland had early beginnings in Harper County during the late 1890s. A canal was dug using only man- and horse-power. Water was diverted from the Cimarron River into the canal and delivered to the surrounding cropland. Work on the canal continued until it was completed in 1905. When completed, the canal was nearly 14 miles long and had an average width of 8 to 12 feet. The area is now known as "Ditch Valley."

## **Industry and Transportation**

Harper County has adequate transportation facilities. State Highway 34 extends along the eastern side of the county and joins U.S. Highway 64 in the northeastern part of the county. U.S. Highway 64 extends east and west, passing through Buffalo and Rosston. U.S. Highway 183 extends north and south through the center of the county. U.S. Highway 283 extends north and south in the western part and connects Rosston and Laverne. In the southwestern part of the county, U.S. Highway 270 and State Highway 3 extend east and west. State Highway 46 extends north and south in the south-central part of the county and joins U.S. Highways 270 and 64.

Agriculture provides a major part of the income in Harper County. Small grains, livestock, hay, and alfalfa are the main products. The livestock are mainly beef cattle and some swine, dairy cattle, and sheep. Several commercial feedlots are located in the county.

The oil and gas industry provides a large number of jobs in the county. There is an extensive network of oil and natural gas wells and pipelines that must be maintained throughout the county. A large natural gas plant is located near Laverne.

## **Physiography and Drainage**

The county resides in two major land resource areas, the Rolling Red Plains in the eastern two-thirds and the Southern High Plains Breaks in the western one-third. The Beaver River flows in the southwestern part of the county and drains the southern part. The Cimarron River flows across the far northwestern part of the county and along the northeastern edge of the county and drains the northern and eastern parts of the county. Buffalo Creek flows easterly, draining the center part of the county, and then connects with the Cimarron River in Woodward County.

The relief of Harper County is dominantly nearly level to gently sloping. The upland area along the divide between the drainage of the Beaver and Cimarron Rivers is dissected by entrenched drainageways that have very steep sides.

Along the north side of the Beaver River is a large, undulating dune field. There is

also a dune field along the north side of Buffalo Creek. This dune field, however, is much smaller than the one associated with the Beaver River. A small part of the dune field associated with the Cimarron River is in the far northwestern corner of the county.

Upland soils in the western part of the county are associated with broad, upland terraces that are nearly level to gently sloping. In the central and eastern parts of the county, the soils are associated with upland terraces that range from nearly level to strongly sloping and residual soils that range from gently sloping to steep.

## Natural Resources

The natural resources of the county are mainly soil, water, petroleum products, and scenic beauty.

The soil and available water are the most important natural resources of the county. A large acreage in the county is productive and has a high potential for native grasses and for wheat, grain sorghum, and alfalfa. Rangeland makes up about two-thirds of the county. In the past, overgrazing and erosion damaged much of the rangeland. Proper management can increase the production of native grasses.

Water, mainly ground water, is an important resource. Ground water can be obtained through shallow wells in the Permian red beds. This water, however, contains gypsum, sulfates, and chlorine and is only suitable for use by livestock. Ponds are constructed to supply water for livestock on many farms. Springs are located throughout the county, and most have been developed. Irrigation water is obtained from wells in the western and southwestern parts of the county. Flood-irrigation water is delivered through the "Old Settlers Ditch" by diverting water from the Cimarron River in the northwestern part of the county.

Oil and gas wells have been drilled and are operating in the county. The Mocane-Laverne Gas field has been very productive in the western half of the county. Gypsum beds outcrop in the eastern parts, and some areas are mined for road gravel.

Harper County is rich in scenic beauty. It has grass-covered sand dunes in the southern part of the county coupled with highly dissected canyons and small buttes in the central and northern parts.

## Climate

Prepared by the Natural Resources Conservation Service, National Water and Climate Center, Portland, Oregon.

The climate tables are based on data from a climate station at Buffalo, Oklahoma. Thunderstorm days, relative humidity, percent sunshine, and wind information are estimated from the first order station at Dodge City, Kansas.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Buffalo in the period 1961 to 1990. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on the length of the growing season.

In winter, the average temperature is 37.2 degrees F and the average daily minimum temperature is 22.7 degrees. The lowest temperature on record, which occurred at Buffalo on January 19, 1984, was -14 degrees. In summer, the average temperature is 80.6 degrees and the average daily maximum temperature is 95.1 degrees. The highest recorded temperature, which occurred at Buffalo on July 29, 1986, was 115 degrees.

Growing degree days are shown in Table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal

monthly accumulation is used to schedule single or successive plantings of crops between the last freeze in spring and the first freeze in fall.

The average annual total precipitation is about 27.86 inches. Of this, about 22.2 inches, or 80 percent, usually falls in April through October. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 6.00 inches at Buffalo on August 10, 1966. Thunderstorms occur on about 51 days each year, and most occur between May and August.

The average seasonal snowfall is 8.7 inches. The greatest snow depth at any one time during the period of record was 36 inches recorded on February 22, 1971. On the average, less than 1 day per year has at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 23.0 inches recorded on February 21, 1971.

The average relative humidity in mid-afternoon is about 45 percent. Humidity is higher at night, and the average at dawn is about 76 percent. The sun shines 78 percent of the time possible in summer and 68 percent in winter. The prevailing wind is from the south during much of the year and is from the north during the winter (December to March). Average wind speed is above 13 miles per hour in all months. The average wind speed is highest, around 15 miles per hour, in March and April.

Table 1.--Temperature and Precipitation  
 [Recorded in the period 1961-90 at Buffalo, Oklahoma]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have--		Average number of growing degree days*	Average	2 years in 10 will have--		Average number of days with 0.10 inch or more	Average snowfall
				Maximum temperature higher than--	Minimum temperature lower than--			Less than--	More than--		
<i>°F</i>	<i>°F</i>	<i>°F</i>	<i>°F</i>	<i>°F</i>	<i>Units</i>	<i>In</i>	<i>In</i>	<i>In</i>		<i>In</i>	
January-----	49.0	20.2	34.6	77	-8	7	0.49	0.20	0.90	1	1.4
February----	55.2	24.7	39.9	84	-2	28	1.04	0.24	1.79	2	4.2
March-----	64.5	33.3	48.9	91	8	118	1.86	0.53	3.04	4	1.0
April-----	75.3	43.9	59.6	96	22	309	2.35	0.89	3.57	4	0.2
May-----	82.8	53.6	68.2	101	34	562	4.36	1.60	6.66	6	0.0
June-----	91.8	63.2	77.5	107	47	823	3.99	1.35	6.16	5	0.0
July-----	97.6	68.6	83.1	109	53	1026	2.99	1.56	4.23	4	0.0
August-----	96.0	66.6	81.3	110	50	969	3.46	1.10	5.38	4	0.0
September---	87.2	58.5	72.9	104	35	685	3.07	0.89	4.83	4	0.0
October-----	77.3	45.8	61.5	96	25	371	1.94	0.67	3.35	3	0.0
November----	61.3	32.7	47.0	85	12	72	1.53	0.43	2.72	3	0.4
December----	50.9	23.1	37.0	75	-1	10	0.80	0.29	1.28	2	1.4
Yearly:											
Average---	74.1	44.5	59.3	---	---	---	---	---	---	---	---
Extreme---	115	-14	---	111	-10	---	---	---	---	---	---
Total-----	---	---	---	---	---	4,981	27.86	21.72	33.54	42	8.7

\* A growing degree-day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Table 2.--Freeze Dates in Spring and Fall  
[Recorded in the period 1961-90 at Buffalo, Oklahoma]

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 11	Apr. 20	Apr. 28
2 years in 10 later than--	Apr. 6	Apr. 15	Apr. 23
5 years in 10 later than--	Mar. 27	Apr. 5	Apr. 14
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 7	Oct. 14	Oct. 1
2 years in 10 earlier than--	Nov. 1	Oct. 19	Oct. 7
5 years in 10 earlier than--	Nov. 10	Oct. 30	Oct. 17

Table 3.--Growing Season  
[Recorded in the period 1961-90 at Buffalo, Oklahoma]

Probability	Daily Minimum Temperature During growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	<i>Days</i>	<i>Days</i>	<i>Days</i>
9 years in 10	208	186	164
8 years in 10	215	193	172
5 years in 10	228	207	185
2 years in 10	240	221	199
1 year in 10	247	229	206



## How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind or segment of the landscape. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landscape, soil scientists develop a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientists to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Individual soils on the landscape commonly merge into one another as their characteristics gradually change. To construct an accurate map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted color, texture, size, and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over

long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years. They cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

The descriptions, names, and delineations of the soils in this survey area may not fully agree with those of the soils in adjacent survey areas. Differences are the result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey areas.

## Detailed Soil Map Units

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The map units on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information about each map unit is given in the Use and Management section of this survey.

A map unit delineation on the detailed soil maps represents an area on the landscape and consists of one or more soils or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils or miscellaneous areas. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, are mapped without areas of minor components of other taxonomic classes. Consequently, map units are made up of the soils or miscellaneous areas for which they are named and some areas of included soils that belong to other taxonomic classes.

Most soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting or similar soils. They may or may not be mentioned in the map unit description. Other soils and miscellaneous areas, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting or dissimilar, minor components. They generally are in small areas and could not be mapped separately because of the scale used. Descriptions of the soils are available in the "Official Series Descriptions," which are online at <http://soils.usda.gov>. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The areas of minor soils or miscellaneous areas are mentioned in the map unit descriptions. A few areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a soil series. Except for differences in texture of the surface layer or of the underlying layers, all the soils of a

series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying layers. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into soil phases. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Selman silt loam, 3 to 5 percent slopes, eroded, is a phase of the Selman series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A complex consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Laverne-Rock outcrop complex, 1 to 12 percent slopes, is an example.

This survey includes miscellaneous areas. Such areas have little or no soil material and support little or no vegetation. Salt flats, 0 to 1 percent slopes, is an example.

Table 4, "Acreage and Proportionate Extent of the Soils," gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
AbbA	Abbie loam, 0 to 1 percent slopes-----	1,997	0.3
AbbB	Abbie loam, 1 to 3 percent slopes-----	5,850	0.9
AbbB2	Abbie loam, 1 to 3 percent slopes, eroded-----	608	*
AbbC	Abbie loam, 3 to 5 percent slopes-----	886	0.1
AbbC2	Abbie loam, 3 to 5 percent slopes, eroded-----	545	*
AbsB	Abilene silt loam, 1 to 3 percent slopes-----	568	*
Ac1A	Abbie clay loam, 0 to 1 percent slopes-----	1,269	0.2
Af1B	Abbie fine sandy loam, 1 to 3 percent slopes-----	7,537	1.1
Af1C	Abbie fine sandy loam, 3 to 5 percent slopes-----	879	0.1
BdaB	Berda loam, 1 to 3 percent slopes-----	1,346	0.2
BdaC	Berda loam, 3 to 5 percent slopes-----	1,239	0.2
BdaD	Berda loam, 5 to 8 percent slopes-----	248	*
CRVE	Cottonwood-Rock outcrop-Vinson complex, 3 to 12 percent slopes-----	13,754	2.1
DAM	Large dam-----	15	*
DevE	Devol loamy fine sand, 8 to 12 percent slopes-----	119	*
DpwB	Deepwood loam, 1 to 3 percent slopes-----	3,143	0.5
DpwC	Deepwood loam, 3 to 5 percent slopes-----	1,876	0.3
DpwD	Deepwood loam, 5 to 8 percent slopes-----	736	0.1
DpwE	Deepwood loam, 8 to 12 percent slopes-----	555	*
Dv1B	Devol fine sandy loam, 1 to 3 percent slopes-----	7,876	1.2
Dv1C	Devol fine sandy loam, 3 to 5 percent slopes-----	6,465	1.0
Dv1D	Devol fine sandy loam, 5 to 8 percent slopes-----	1,309	0.2
Ed1C	Eda loamy sand, 1 to 5 percent slopes-----	3,466	0.5
Ed1E	Eda loamy sand, 5 to 12 percent slopes-----	20,549	3.1
FayB	Farry fine sandy loam, 1 to 3 percent slopes-----	4,309	0.6
FayC	Farry fine sandy loam, 3 to 5 percent slopes-----	801	0.1
FoFE	Fortyone-Farry complex, 5 to 12 percent slopes-----	1,615	0.2
FrkA	Frankirk silt loam, 0 to 1 percent slopes-----	153	*
FrkB	Frankirk silt loam, 1 to 3 percent slopes-----	705	0.1
FtnB	Fortyone sandy loam, 1 to 3 percent slopes-----	2,947	0.4
FtnC	Fortyone sandy loam, 3 to 5 percent slopes-----	2,198	0.3
FtnD	Fortyone sandy loam, 5 to 8 percent slopes-----	423	*
GcsA	Gracemore fine sandy loam, 0 to 1 percent slopes, rarely flooded-----	1,273	0.2
GdfB	Grandfield fine sandy loam, 1 to 3 percent slopes-----	8,955	1.3
GdfC	Grandfield fine sandy loam, 3 to 5 percent slopes-----	588	*
GDGE	Grandfield-Devol-Grandmore complex, 1 to 12 percent slopes-----	2,695	0.4
GdmB	Grandmore fine sandy loam, 1 to 3 percent slopes-----	2,951	0.4
GfsA	Gracemore fine sandy loam, saline, 0 to 1 percent slopes, occasionally flooded-----	690	0.1
GmrA	Gracemont fine sandy loam, 0 to 1 percent slopes, rarely flooded-----	447	*
GmsA	Gracemont fine sandy loam, saline, 0 to 1 percent slopes, rarely flooded-----	752	0.1
GrmA	Gracemore fine sandy loam, saline, 0 to 1 percent slopes, rarely flooded-----	2,565	0.4
HdGB	Hardeman-Grandmore complex, 1 to 3 percent slopes-----	2,587	0.4
HdGC	Hardeman-Grandmore complex, 3 to 5 percent slopes-----	398	*
HdmB	Hardeman fine sandy loam, 1 to 3 percent slopes-----	12,479	1.9
HdmC	Hardeman fine sandy loam, 3 to 5 percent slopes-----	2,874	0.4
IreA	Irene silt loam, 0 to 1 percent slopes-----	2,720	0.4
IreB	Irene silt loam, 1 to 3 percent slopes-----	1,334	0.2
IreC	Irene silt loam, 3 to 5 percent slopes-----	172	*
IreD	Irene silt loam, 5 to 8 percent slopes-----	56	*
JssF	Jester sand, 5 to 12 percent slopes-----	7,805	1.2
JstC	Jester loamy fine sand, 1 to 5 percent slopes-----	11,579	1.7
KidB	Kingsdown fine sandy loam, 1 to 3 percent slopes-----	2,782	0.4
KiHE	Kingsdown-Hardeman complex, 0 to 12 percent slopes-----	4,923	0.7
LgtA	Lugert silt loam, 0 to 1 percent slopes, occasionally flooded-----	1,388	0.2
LiJC	Lincoln-Jester complex, 0 to 5 percent slopes, rarely flooded-----	4,483	0.7
LikB	Likes fine sandy loam, 1 to 3 percent slopes-----	1,784	0.3
LisA	Lincoln sand, 0 to 1 percent slopes, frequently flooded-----	1,036	0.2
LncA	Lincoln clay loam, 0 to 1 percent slopes, rarely flooded-----	6,152	0.9
LROE	Laverne-Rock outcrop complex, 1 to 12 percent slopes-----	1,325	0.2
LshA	Lesho clay loam, 0 to 1 percent slopes, rarely flooded-----	2,313	0.3

\* See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
LsoA	Lincoln sand, 0 to 1 percent slopes, occasionally flooded-----	11,829	1.8
M-W	Miscellaneous water-----	62	*
MLBB	Mobeetie-Likes-Berda complex, 1 to 3 percent slopes-----	9,093	1.4
MLBC	Mobeetie-Likes-Berda complex, 3 to 5 percent slopes-----	5,264	0.8
MLBE	Mobeetie-Likes-Berda complex, 5 to 12 percent slopes-----	5,841	0.9
MnsB	Mansic clay loam, 1 to 3 percent slopes-----	2,872	0.4
MnsC	Mansic clay loam, 3 to 5 percent slopes-----	2,210	0.3
MsnB	Manson loam, 1 to 3 percent slopes-----	4,380	0.7
MsnC	Manson loam, 3 to 5 percent slopes-----	658	*
MsnC2	Manson loam, 3 to 5 percent slopes, eroded-----	534	*
OMBE	Oklark-Mansic-Berda complex, 5 to 12 percent slopes-----	6,030	0.9
OMBG	Oklark-Mansic-Berda complex, 12 to 45 percent slopes-----	4,238	0.6
PdoA	Paloduro clay loam, 0 to 1 percent slopes-----	1,023	0.2
PdoB	Paloduro clay loam, 1 to 3 percent slopes-----	499	*
PdoC2	Paloduro clay loam, 3 to 5 percent slopes, eroded-----	98	*
PIT	Pits-----	194	*
PlmB	Plemons loam, 1 to 3 percent slopes-----	3,648	0.5
PlmC	Plemons loam, 3 to 5 percent slopes-----	2,453	0.4
PlmD	Plemons loam, 5 to 8 percent slopes-----	141	*
QnWC3	Quinlan-Woodward complex, 3 to 5 percent slopes, severely eroded-----	3,514	0.5
QnWD	Quinlan-Woodward complex, 5 to 8 percent slopes-----	8,552	1.3
QnWE	Quinlan-Woodward complex, 5 to 12 percent slopes-----	656	*
QRWG	Quinlan-Rock outcrop-Woodward complex, 5 to 45 percent slopes-----	2,789	0.4
QRYG	Quinlan-Rock outcrop-Yomont complex, 0 to 45 percent slopes-----	53,004	8.0
QWDE	Quinlan-Woodward-Deepwood complex, 5 to 12 percent slopes-----	47,923	7.2
QWRC	Quinlan-Woodward-Rock outcrop complex, 1 to 5 percent slopes-----	1,150	0.2
RoCH	Rock outcrop-Cottonwood complex, 12 to 80 percent slopes-----	13,254	2.0
RssA	Rosston clay, ponded, 0 to 1 percent slopes-----	778	0.1
SAL	Salt flats, 0 to 1 percent slopes-----	700	0.1
SelA	Selman silt loam, 0 to 1 percent slopes-----	2,701	0.4
SelB	Selman silt loam, 1 to 3 percent slopes-----	48,695	7.3
SelC	Selman silt loam, 3 to 5 percent slopes-----	17,725	2.7
SelC2	Selman silt loam, 3 to 5 percent slopes, eroded-----	8,132	1.2
SelD	Selman silt loam, 5 to 8 percent slopes-----	3,544	0.5
SelD2	Selman silt loam, 5 to 8 percent slopes, eroded-----	2,389	0.4
SprA	Spur loam, 0 to 1 percent slopes, rarely flooded-----	3,288	0.5
SpsA	Spur loam, saline, 0 to 1 percent slopes, rarely flooded-----	807	0.1
StpA	St. Paul silt loam, 0 to 1 percent slopes-----	12,620	1.9
StpB	St. Paul silt loam, 1 to 3 percent slopes-----	19,032	2.9
StpC	St. Paul silt loam, 3 to 5 percent slopes-----	2,425	0.4
StpD	St. Paul silt loam, 5 to 8 percent slopes-----	1,227	0.2
TeWE	Teagard-Wellsford complex, 1 to 12 percent slopes-----	235	*
TexA	Texroy loam, 0 to 1 percent slopes-----	160	*
TexB	Texroy loam, 1 to 3 percent slopes-----	1,257	0.2
TexC	Texroy loam, 3 to 5 percent slopes-----	207	*
TipA	Tipton loam, 0 to 1 percent slopes-----	717	0.1
TipB	Tipton loam, 1 to 3 percent slopes-----	1,934	0.3
TipC	Tipton loam, 3 to 5 percent slopes-----	266	*
TipD	Tipton loam, 5 to 8 percent slopes-----	72	*
TRQC	Talpa-Rock outcrop-Quinlan complex, 1 to 5 percent slopes-----	1,943	0.3
TvlC	Tivoli fine sand, 1 to 5 percent slopes-----	1,869	0.3
TvlE	Tivoli fine sand, 5 to 12 percent slopes-----	20,603	3.1
TvlG	Tivoli fine sand, 12 to 45 percent slopes-----	10,410	1.6
VerB	Vernon clay loam, 1 to 3 percent slopes-----	2,869	0.4
VerC	Vernon clay loam, 3 to 5 percent slopes-----	8,313	1.3
VerD	Vernon clay loam, 5 to 8 percent slopes-----	2,380	0.4
VrrB	Vernon sandy loam, 1 to 3 percent slopes, overblown-----	906	0.1
VrrC	Vernon sandy loam, 3 to 5 percent slopes, overblown-----	724	0.1
W	Water-----	2,319	0.3
WodA	Woods clay loam, 0 to 1 percent slopes-----	189	*
WodB	Woods clay loam, 1 to 3 percent slopes-----	1,398	0.2

\* See footnote at end of table.



Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
WodC	Woods clay loam, 3 to 5 percent slopes-----	288	*
WQHE	Westola-Quinlan-Hardeman complex, 0 to 12 percent slopes-----	41,808	6.3
WQnB	Woodward-Quinlan complex, 1 to 3 percent slopes-----	16,751	2.5
WQnC	Woodward-Quinlan complex, 3 to 5 percent slopes-----	35,359	5.3
WslA	Westola fine sandy loam, 0 to 1 percent slopes, occasionally flooded-----	2,234	0.3
WstA	Westola fine sandy loam, 0 to 1 percent slopes, rarely flooded-----	6,688	1.0
YmrA	Yomont loam, 0 to 1 percent slopes, rarely flooded-----	296	*
YmtA	Yomont loam, 0 to 1 percent slopes, occasionally flooded-----	1,599	0.2
	Total-----	664,858	100.0

\* Less than 0.1 percent.

## **AbbA—Abbie loam, 0 to 1 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 77E  
*General location:* Western part of the county  
*Elevation:* 2,100 to 2,450 feet  
*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F  
*Frost-free period:* 185 to 200 days  
*Shape of individual mapped areas:* Irregular  
*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Abbie and similar soils**

*Extent of the component in the map unit:* 100 percent  
*Geomorphic setting:* Paleoterraces on uplands  
*Position on landform:* Summits  
*Parent material:* Alluvium  
*Slope:* 0 to 1 percent  
*Runoff:* Low  
*Soil depth:* More than 60 inches  
*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
     Moderately slow  
*Slowest permeability class within a depth of 80 inches:* Moderately slow  
*Drainage class:* Well drained  
*Available water capacity:* About 9.3 inches  
*Depth to a seasonal high water table:* More than 6 feet  
*Flooding:* None  
*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—1  
 Land capability classification, irrigated—1  
 Ecological site number and name—077EY048OK, Limy Upland

#### *Representative profile:*

A—0 to 12 inches; loam  
 Bt—12 to 23 inches; loam  
 Btk—23 to 42 inches; clay loam  
 C—42 to 80 inches; loam

*Location of representative profile:* About 1,850 feet south and 300 feet west of the northeast corner of sec. 33, T. 28 N., R. 25 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **AbbB—Abbie loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 77E  
*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet  
*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F  
*Frost-free period:* 185 to 200 days  
*Shape of individual mapped areas:* Irregular  
*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Abbie and similar soils**

*Extent of the component in the map unit:* 95 percent  
*Geomorphic setting:* Paleoterraces on uplands  
*Position on landform:* Summits  
*Parent material:* Alluvium  
*Slope:* 1 to 3 percent  
*Runoff:* Medium  
*Soil depth:* More than 60 inches  
*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
    Moderately slow  
*Slowest permeability class within a depth of 80 inches:* Moderately slow  
*Drainage class:* Well drained  
*Available water capacity:* About 9.6 inches  
*Depth to a seasonal high water table:* More than 6 feet  
*Flooding:* None  
*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—2e  
Land capability classification, irrigated—2e  
Ecological site number and name—077EY048OK, Limy Upland

#### *Representative profile:*

Ap—0 to 12 inches; loam  
Bt—12 to 24 inches; clay loam  
Btk—24 to 44 inches; clay loam  
Akb—44 to 49 inches; loam  
Btkb—49 to 91 inches; clay loam

*Location of representative profile:* About 1,700 feet south and 1,800 feet west of the northeast corner of sec. 23, T. 28 N., R. 26 W. (fig. 2)

### ***Minor Components***

- Kingsdown and similar soils: 3 percent
- Frankirk and similar soils: 2 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **AbbB2—Abbie loam, 1 to 3 percent slopes, eroded**

### ***Map Unit Setting***

*Major land resource area:* 77E  
*General location:* Western part of the county



Figure 2.—Profile of a soil in the Abbie series.

*Elevation:* 2,100 to 2,450 feet  
*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F  
*Frost-free period:* 185 to 200 days  
*Shape of individual mapped areas:* Irregular  
*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Abbie and similar soils**

*Extent of the component in the map unit:* 100 percent  
*Geomorphic setting:* Paleoterraces on uplands  
*Position on landform:* Summits and shoulders  
*Parent material:* Alluvium  
*Slope:* 1 to 3 percent  
*Runoff:* Medium  
*Soil depth:* More than 60 inches  
*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
    Moderately slow  
*Slowest permeability class within a depth of 80 inches:* Moderately slow  
*Drainage class:* Well drained  
*Available water capacity:* About 9.1 inches  
*Depth to a seasonal high water table:* More than 6 feet  
*Flooding:* None  
*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—3e  
Land capability classification, irrigated—3e  
Ecological site number and name—077EY848OK, Reseeded Limy Upland

#### *Representative profile:*

A—0 to 7 inches; loam  
Bt—7 to 17 inches; clay loam  
Btk—17 to 32 inches; clay loam  
BCk—32 to 42 inches; clay loam  
C—42 to 80 inches; sandy clay loam

*Location of representative profile:* About 450 feet north and 1,325 feet west of the southeast corner of sec. 13, T. 28 N., R. 26 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **AbbC—Abbie loam, 3 to 5 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 77E  
*General location:* Western part of the county  
*Elevation:* 2,100 to 2,450 feet  
*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F  
*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Abbie and similar soils**

*Extent of the component in the map unit:* 95 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Shoulders

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 9.8 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

A—0 to 14 inches; loam

Bt—14 to 26 inches; sandy clay loam

Btk—26 to 38 inches; sandy clay loam

BCK—38 to 56 inches; loam

C—56 to 80 inches; loam

*Location of representative profile:* About 2,600 feet south and 1,900 feet west of the northeast corner of sec. 28, T. 25 N., R. 21 W.

### ***Minor Components***

- Kingsdown and similar soils: 5 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **AbbC2—Abbie loam, 3 to 5 percent slopes, eroded**

### ***Map Unit Setting***

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres



### ***Major Component Description***

#### **Abbie and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Shoulders

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 9.7 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—077EY848OK, Reseeded Limy Upland

*Representative profile:*

A—0 to 12 inches; loam

Bt—12 to 23 inches; loam

Btk—23 to 37 inches; loam

BCK—37 to 51 inches; loam

C—51 to 80 inches; sandy loam

*Location of representative profile:* About 500 feet north and 150 feet west of the southeast corner of sec. 25, T. 28 N., R. 26 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections "Use and Management of the Soils" and "Soil Properties."

## **AbsB—Abilene silt loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Eastern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Abilene and similar soils**

*Extent of the component in the map unit:* 85 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Summits

*Parent material:* Alluvium

*Slope:* 1 to 3 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 9.2 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—2e

Land capability classification, irrigated—2e

Ecological site number and name—078XY041OK, Hardland (north)

*Representative profile:*

A—0 to 9 inches; silt loam

BA—9 to 18 inches; silty clay loam

Bt—18 to 26 inches; silty clay

Btk—26 to 57 inches; silty clay

C—57 to 80 inches; silty clay

*Location of representative profile:* About 2,600 feet south and 1,300 feet west of the northeast corner of sec. 13, T. 28 N., R. 24 W.

### **Minor Components**

- St. Paul and similar soils: 10 percent
- Selman and similar soils: 5 percent

### **Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **AclA—Abbie clay loam, 0 to 1 percent slopes**

### **Map Unit Setting**

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### **Major Component Description**

#### **Abbie and similar soils**

*Extent of the component in the map unit:* 87 percent

*Geomorphic setting:* Paleoterraces on uplands



*Position on landform:* Summits

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 9.7 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—1

Land capability classification, irrigated—1

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

Ap—0 to 13 inches; clay loam

Bt—13 to 24 inches; clay loam

Btk—24 to 61 inches; clay loam

Akb—61 to 67 inches; clay loam

Bkb—67 to 80 inches; sandy clay loam

*Location of representative profile:* About 1,250 feet north and 1,500 feet east of the southwest corner of sec. 14, T. 27 N., R. 25 W.

### **Minor Components**

- Paloduro and similar soils: 9 percent
- Grandmore and similar soils: 4 percent

### **Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **Af1B—Abbie fine sandy loam, 1 to 3 percent slopes**

### **Map Unit Setting**

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### **Major Component Description**

#### **Abbie and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Summits

*Parent material:* Alluvium

*Slope:* 1 to 3 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 8.2 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—2e

Land capability classification, irrigated—2e

Ecological site number and name—077EY049OK, Limy Sandy Plains

*Representative profile:*

Ap—0 to 7 inches; fine sandy loam

Btk1—7 to 14 inches; sandy clay loam

Btk2—14 to 47 inches; clay loam

Btk3—47 to 80 inches; sandy clay loam

*Location of representative profile:* About 1,000 feet south and 100 feet west of the northeast corner of sec. 30, T. 27 N., R. 24 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **Af1C—Abbie fine sandy loam, 3 to 5 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Abbie and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Shoulders

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 8.9 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—077EY049OK, Limy Sandy Plains

*Representative profile:*

A—0 to 13 inches; fine sandy loam

Bt—13 to 27 inches; loam

Btk—27 to 45 inches; loam

BCK—45 to 57 inches; sandy loam

C—57 to 80 inches; sandy loam

*Location of representative profile:* About 1,350 feet south and 300 feet east of the northwest corner of sec. 20, T. 28 N., R. 25 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **BdaB—Berda loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Berda and similar soils**

*Extent of the component in the map unit:* 84 percent

*Geomorphic setting:* Hillslopes on hills on uplands

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 1 to 3 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 8.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

A—0 to 6 inches; loam

Bk1—6 to 19 inches; loam

Bk2—19 to 39 inches; loam

Bk3—39 to 80 inches; loam

*Location of representative profile:* About 1,200 feet north and 650 feet west of the southeast corner of sec. 29, T. 28 N., R. 25 W.

### ***Minor Components***

- Mobeetie and similar soils: 16 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **BdaC—Berda loam, 3 to 5 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Berda and similar soils**

*Extent of the component in the map unit:* 80 percent

*Geomorphic setting:* Hillslopes on hills on uplands

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 8.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

A—0 to 8 inches; loam

Bk1—8 to 17 inches; loam

Bk2—17 to 25 inches; loam

Bk3—25 to 35 inches; loam

C—35 to 80 inches; loam

*Location of representative profile:* About 600 feet north and 1,400 feet west of the southeast corner of sec. 35, T. 29 N., R. 23 W.

**Minor Components**

- Mobeetie and similar soils: 20 percent

**Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**BdaD—Berda loam, 5 to 8 percent slopes**

**Map Unit Setting**

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

**Major Component Description**

**Berda and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Hillslopes on hills on uplands

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 5 to 8 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 8.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4e

Land capability classification, irrigated—4e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

A—0 to 9 inches; loam

Bk1—9 to 25 inches; clay loam

Bk2—25 to 46 inches; loam

C—46 to 80 inches; fine sandy loam

*Location of representative profile:* About 1,100 feet north and 2,075 feet west of the southeast corner of sec. 10, T. 27 N., R. 24 W.

**Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **CRVE—Cottonwood-Rock outcrop-Vinson complex, 3 to 12 percent slopes**

**Map Unit Setting**

*Major land resource area:* 78C

*General location:* Eastern part of the county

*Elevation:* 1,600 to 1,800 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

**Major Component Description****Cottonwood and similar soils**

*Extent of the component in the map unit:* 37 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Shoulders

*Parent material:* Residuum weathered from gypsum

*Slope:* 3 to 12 percent

*Runoff:* High

*Soil depth:* 3 to 12 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 1.2 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—7s

Ecological site number and name—078XY038OK, Gyp

*Representative profile:*

A—0 to 8 inches; loam

Cr—8 to 12 inches; gypsum bedrock

*Location of representative profile:* About 1,650 feet north and 1,300 feet west of the southeast corner of sec. 33, T. 28 N., R. 20 W.**Rock outcrop***Extent of the component in the map unit:* 28 percent*Geomorphic setting:* Hills on uplands*Position on landform:* Backslopes*Parent material:* Gypsum*Slope:* 3 to 12 percent*Runoff:* High*Soil depth:* 0 to 3 inches to lithic bedrock*Interpretive groups:*

Land capability classification, nonirrigated—8

*Location of representative area:* About 1,700 feet north and 1,300 feet west of the southeast corner of sec. 33, T. 28 N., R. 20 W.**Vinson and similar soils***Extent of the component in the map unit:* 12 percent*Geomorphic setting:* Hills on uplands*Position on landform:* Shoulders*Parent material:* Residuum weathered from gypsum*Slope:* 3 to 5 percent*Runoff:* High*Soil depth:* 20 to 40 inches to paralithic bedrock*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate*Slowest permeability class within a depth of 80 inches:* Very slow*Drainage class:* Well drained*Available water capacity:* About 6.4 inches*Depth to a seasonal high water table:* More than 6 feet*Flooding:* None*Ponding:* None*Interpretive groups:*

Land capability classification, nonirrigated—3e

Ecological site number and name—078XY057OK, Loamy Prairie (cal)

*Representative profile:*

A—0 to 10 inches; loam

Bk1—10 to 23 inches; loam

Bk2—23 to 34 inches; loam

Cr—34 to 38 inches; gypsum bedrock

*Location of representative profile:* About 600 feet north and 1,550 feet west of the southeast corner of sec. 33, T. 28 N., R. 20 W.**Minor Components**

- Selman and similar soils: 7 percent
- Knoco and similar soils: 6 percent
- Burford and similar soils: 5 percent
- Tillman and similar soils: 5 percent

### ***Management***

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **DAM—Large dam**

### ***Map Unit Setting***

*Major land resource area:* 78C

*Elevation:* 700 to 2,000 feet

*Mean annual precipitation:* 22 to 40 inches

*Mean annual air temperature:* 57 to 64 degrees F

*Frost-free period:* 185 to 230 days

### ***Major Component Description***

#### **Dam**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Hills on uplands

*Parent material:* Mine spoil or earthy fill derived from sandstone and shale

*Slope:* 0 to 45 percent

*Runoff:* Very high

*Interpretive groups:*

Land capability classification, nonirrigated—8

*Location of representative area:* About 480 feet north and 1,350 feet west of the southeast corner of sec. 22, T. 13 N., R. 4 W.

### ***Management***

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **DevE—Devol loamy fine sand, 8 to 12 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Southern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Devol and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Interdune areas and dunes in dune fields on sandhills on uplands

*Parent material:* Eolian sands

*Slope:* 8 to 12 percent

*Runoff:* Low

*Soil depth:* More than 60 inches



*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 6.5 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—078XY014OK, Deep Sand

*Representative profile:*

A—0 to 8 inches; loamy fine sand

Bt—8 to 23 inches; fine sandy loam

BC—23 to 43 inches; loamy fine sand

C—43 to 80 inches; loamy fine sand

*Location of representative profile:* About 2,850 feet north and 1,950 feet east of the southwest corner of sec. 31, T. 25 N., R. 20 W.

### ***Management***

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **DpwB—Deepwood loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Eastern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Deepwood and similar soils**

*Extent of the component in the map unit:* 82 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Backslopes and footslopes

*Parent material:* Colluvium from sandstone

*Slope:* 1 to 3 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 11.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—2e

Ecological site number and name—078XY057OK, Loamy Prairie (cal)

*Representative profile:*

A—0 to 6 inches; loam

Bk1—6 to 21 inches; loam

Bk2—21 to 43 inches; loam

BC—43 to 59 inches; loam

C—59 to 80 inches; loam

*Location of representative profile:* About 1,050 feet south and 2,450 feet east of the northwest corner of sec. 34, T. 28 N., R. 23 W.

### ***Minor Components***

- Hardeman and similar soils: 9 percent
- Selman and similar soils: 6 percent
- Woodward and similar soils: 3 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **DpwC—Deepwood loam, 3 to 5 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Eastern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Deepwood and similar soils**

*Extent of the component in the map unit:* 79 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Footslopes

*Parent material:* Colluvium from sandstone

*Slope:* 3 to 5 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 11.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Ecological site number and name—078XY057OK, Loamy Prairie (cal)

*Representative profile:*

A—0 to 10 inches; loam

Bw—10 to 23 inches; loam

Bk—23 to 36 inches; loam

BCK—36 to 60 inches; loam

C—60 to 80 inches; loam

*Location of representative profile:* About 650 feet south and 500 feet east of the northwest corner of sec. 33, T. 28 N., R. 23 W.

### **Minor Components**

- St. Paul and similar soils: 14 percent
- Woodward and similar soils: 7 percent

### **Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **DpWD—Deepwood loam, 5 to 8 percent slopes**

### **Map Unit Setting**

*Major land resource area:* 78C

*General location:* Eastern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### **Major Component Description**

#### **Deepwood and similar soils**

*Extent of the component in the map unit:* 90 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Footslopes

*Parent material:* Colluvium from sandstone

*Slope:* 5 to 8 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 11.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4e

Ecological site number and name—078XY057OK, Loamy Prairie (cal)

*Representative profile:*

Ap—0 to 12 inches; loam

Bw1—12 to 29 inches; loam

Bw2—29 to 51 inches; loam

BC—51 to 80 inches; very fine sandy loam

*Location of representative profile:* About 5,000 feet south and 2,800 feet east of the northwest corner of sec. 31, T. 26 N., R. 21 W. (fig. 3)

**Minor Components**

- Hardeman and similar soils: 5 percent
- Quinlan and similar soils: 5 percent

**Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**DpwE—Deepwood loam, 8 to 12 percent slopes****Map Unit Setting**

*Major land resource area:* 78C

*General location:* Eastern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

**Major Component Description****Deepwood and similar soils**

*Extent of the component in the map unit:* 89 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Footslopes

*Parent material:* Colluvium from sandstone

*Slope:* 8 to 12 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 11.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—078XY057OK, Loamy Prairie (cal)



Figure 3.—Profile of a soil in the Deepwood series.

*Representative profile:*

A—0 to 8 inches; loam

Bw—8 to 27 inches; loam

Bk—27 to 53 inches; loam

C—53 to 80 inches; loam

*Location of representative profile:* About 250 feet south and 1,500 feet west of the northeast corner of sec. 31, T. 27 N., R. 23 W.

**Minor Components**

- Woodward and similar soils: 11 percent

**Management**

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**DvIB—Devol fine sandy loam, 1 to 3 percent slopes****Map Unit Setting**

*Major land resource area:* 78C

*General location:* Southern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

**Major Component Description****Devol and similar soils**

*Extent of the component in the map unit:* 83 percent

*Geomorphic setting:* Interdune areas and dunes in dune fields on sandhills on uplands

*Parent material:* Eolian sands

*Slope:* 1 to 3 percent

*Runoff:* Very low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:* Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 6.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

A1—0 to 5 inches; fine sandy loam

A2—5 to 13 inches; fine sandy loam



Bt—13 to 29 inches; fine sandy loam  
 Btk—29 to 42 inches; fine sandy loam  
 C—42 to 80 inches; loamy fine sand

*Location of representative profile:* About 2,000 feet north and 600 feet east of the southwest corner of sec. 15, T. 27 N., R. 25 W.

### ***Minor Components***

- Grandmore and similar soils: 10 percent
- Grandfield and similar soils: 7 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **DvIC—Devol fine sandy loam, 3 to 5 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C  
*General location:* Southern part of the county  
*Elevation:* 1,800 to 2,200 feet  
*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F  
*Frost-free period:* 185 to 200 days  
*Shape of individual mapped areas:* Irregular  
*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Devol and similar soils**

*Extent of the component in the map unit:* 93 percent  
*Geomorphic setting:* Interdune areas and dunes in dune fields on sandhills on uplands  
*Parent material:* Eolian sands  
*Slope:* 3 to 5 percent  
*Runoff:* Very low  
*Soil depth:* More than 60 inches  
*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:* Moderately rapid  
*Slowest permeability class within a depth of 80 inches:* Moderately rapid  
*Drainage class:* Well drained  
*Available water capacity:* About 6.4 inches  
*Depth to a seasonal high water table:* More than 6 feet  
*Flooding:* None  
*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—3e  
 Land capability classification, irrigated—3e  
 Ecological site number and name—078XY073OK, Sandy Prairie

#### *Representative profile:*

A—0 to 6 inches; fine sandy loam  
 Bt—6 to 23 inches; fine sandy loam

Bw—23 to 38 inches; fine sandy loam  
2Bk—38 to 49 inches; loamy fine sand  
2Bw—49 to 80 inches; loamy fine sand

*Location of representative profile:* About 1,800 feet north and 500 feet east of the southwest corner of sec. 6, T. 27 N., R. 25 W. (fig. 4)



Figure 4.—Profile of a soil in the Devol series.



### ***Minor Components***

- Eda and similar soils: 3 percent
- Grandfield and similar soils: 2 percent
- Grandmore and similar soils: 2 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **DvID—Devol fine sandy loam, 5 to 8 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Southern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Devol and similar soils**

*Extent of the component in the map unit:* 90 percent

*Geomorphic setting:* Dunes in dune fields on sandhills on uplands

*Parent material:* Eolian sands

*Slope:* 5 to 8 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 6.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—4e

Land capability classification, irrigated—4e

Ecological site number and name—078XY073OK, Sandy Prairie

#### *Representative profile:*

A—0 to 6 inches; fine sandy loam

Bt1—6 to 16 inches; fine sandy loam

Bt2—16 to 25 inches; fine sandy loam

BC—25 to 43 inches; fine sandy loam

C—43 to 80 inches; loamy fine sand

*Location of representative profile:* About 1,400 feet south and 1,600 feet east of the northwest corner of sec. 30, T. 25 N., R. 20 W.

### ***Minor Components***

- Grandfield and similar soils: 10 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **Ed1C—Eda loamy sand, 1 to 5 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Along major rivers and streams

*Elevation:* 1,600 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 20 to 500 acres

### ***Major Component Description***

#### **Eda and similar soils**

*Extent of the component in the map unit:* 86 percent

*Geomorphic setting:* Dunes in dune fields in river valleys

*Parent material:* Eolian sands

*Slope:* 1 to 5 percent

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Rapid

*Slowest permeability class within a depth of 80 inches:* Rapid

*Drainage class:* Somewhat excessively drained

*Available water capacity:* About 4.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4e

Ecological site number and name—078XY014OK, Deep Sand

*Representative profile:*

A—0 to 7 inches; loamy sand

Bt—7 to 15 inches; loamy fine sand

BC—15 to 23 inches; loamy fine sand

C—23 to 80 inches; fine sand

*Location of representative profile:* About 1,000 feet north and 850 feet west of the southeast corner of sec. 29, T. 25 N., R. 22 W.

### ***Minor Components***

- Hardeman and similar soils: 14 percent

### ***Management***

*Major uses:* Rangeland (fig. 5)

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **EdIE—Eda loamy sand, 5 to 12 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Along major rivers and streams

*Elevation:* 1,600 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 20 to 500 acres

### ***Major Component Description***

#### **Eda and similar soils**

*Extent of the component in the map unit:* 75 percent

*Geomorphic setting:* Dunes in dune fields in river valleys

*Parent material:* Eolian sands

*Slope:* 5 to 12 percent

*Runoff:* Very low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Rapid

*Slowest permeability class within a depth of 80 inches:* Rapid



Figure 5.—Native range in an area of Eda loamy sand, 1 to 5 percent slopes.

*Drainage class:* Somewhat excessively drained

*Available water capacity:* About 4.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—078XY022OK, Dune

*Representative profile:*

A—0 to 10 inches; loamy sand

Bt—10 to 19 inches; loamy fine sand

BC—19 to 28 inches; loamy fine sand

C—28 to 45 inches; loamy sand

2C—45 to 104 inches; sand

*Location of representative profile:* About 4,200 feet south and 2,200 feet west of the northeast corner of sec. 26, T. 25 N., R. 22 W. (fig. 6)

### **Minor Components**

- Devol and similar soils: 7 percent
- Tipton and similar soils: 7 percent
- Berda and similar soils: 4 percent
- Hardeman and similar soils: 4 percent
- Grandfield and similar soils: 3 percent

### **Management**

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **FayB—Farry fine sandy loam, 1 to 3 percent slopes**

### **Map Unit Setting**

*Major land resource area:* 78C

*General location:* Eastern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### **Major Component Description**

#### **Farry and similar soils**

*Extent of the component in the map unit:* 93 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Summits

*Parent material:* Alluvium

*Slope:* 1 to 3 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate





Figure 6.—Profile of a soil in the Eda series.

*Slowest permeability class within a depth of 80 inches: Moderate*

*Drainage class: Well drained*

*Available water capacity: About 8.0 inches*

*Depth to a seasonal high water table: More than 6 feet*

*Flooding: None*

*Ponding: None*

*Interpretive groups:*

Land capability classification, nonirrigated—2e

Land capability classification, irrigated—2e

Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

Ap—0 to 13 inches; fine sandy loam

Bt—13 to 35 inches; sandy clay loam

Btk—35 to 47 inches; sandy clay loam

C—47 to 80 inches; sandy loam

*Location of representative profile:* About 1,100 feet south and 700 feet east of the northwest corner of sec. 16, T. 29 N., R. 21 W.

**Minor Components**

- Fortyone and similar soils: 7 percent

**Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**FayC—Farry fine sandy loam, 3 to 5 percent slopes****Map Unit Setting**

*Major land resource area:* 78C

*General location:* Eastern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

**Major Component Description****Farry and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Shoulders

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 7.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e  
 Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

A—0 to 12 inches; fine sandy loam  
 Bt1—12 to 19 inches; fine sandy loam  
 Bt2—19 to 28 inches; sandy clay loam  
 BCk—28 to 42 inches; sandy loam  
 C—42 to 80 inches; sandy loam

*Location of representative profile:* About 700 feet south and 400 feet east of the northwest corner of sec. 17, T. 29 N., R. 23 W.

***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**FoFE—Fortyone-Farry complex, 5 to 12 percent slopes**

***Map Unit Setting***

*Major land resource area:* 78C  
*General location:* Eastern part of the county  
*Elevation:* 1,800 to 2,200 feet  
*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F  
*Frost-free period:* 185 to 200 days  
*Shape of individual mapped areas:* Irregular  
*Size of areas:* 10 to 200 acres

***Major Component Description***

**Fortyone and similar soils**

*Extent of the component in the map unit:* 70 percent  
*Geomorphic setting:* Paleoterraces on uplands  
*Position on landform:* Backslopes  
*Parent material:* Alluvium  
*Slope:* 5 to 12 percent  
*Runoff:* Low  
*Soil depth:* More than 60 inches  
*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
     Moderately rapid  
*Slowest permeability class within a depth of 80 inches:* Moderately rapid  
*Drainage class:* Well drained  
*Available water capacity:* About 5.1 inches  
*Depth to a seasonal high water table:* More than 6 feet  
*Flooding:* None  
*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e  
 Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

A—0 to 8 inches; sandy loam  
 Bt—8 to 16 inches; sandy loam

Bw—16 to 24 inches; sandy loam

C1—24 to 34 inches; loamy sand

C2—34 to 80 inches; loamy sand

*Location of representative profile:* About 1,800 feet south and 2,500 feet east of the northwest corner of sec. 11, T. 27 N., R. 24 W.

#### **Farry and similar soils**

*Extent of the component in the map unit:* 30 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Shoulders and backslopes

*Parent material:* Alluvium

*Slope:* 5 to 12 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 7.2 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

A—0 to 10 inches; sandy loam

Bt1—10 to 18 inches; sandy clay loam

Bt2—18 to 25 inches; sandy loam

C1—25 to 36 inches; loamy coarse sand

C2—36 to 80 inches; loamy coarse sand

*Location of representative profile:* About 1,600 feet south and 2,300 feet east of the northwest corner of sec. 11, T. 27 N., R. 24 W.

#### **Management**

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

### **FrkA—Frankirk silt loam, 0 to 1 percent slopes**

#### **Map Unit Setting**

*Major land resource area:* 78C

*General location:* Eastern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres



### ***Major Component Description***

#### **Frankirk and similar soils**

*Extent of the component in the map unit:* 77 percent

*Geomorphic setting:* Terraces on uplands

*Position on landform:* Treads

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 10.6 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—1

Land capability classification, irrigated—1

Ecological site number and name—078XY041OK, Hardland (north)

*Representative profile:*

Ap—0 to 8 inches; silt loam

BA—8 to 15 inches; silty clay loam

Bt—15 to 24 inches; silty clay loam

Btk—24 to 58 inches; silty clay loam

BCk—58 to 80 inches; silt loam

*Location of representative profile:* About 1,600 feet north and 800 feet west of the southeast corner of sec. 24, T. 29 N., R. 22 W.

### ***Minor Components***

- Selman and similar soils: 17 percent
- St. Paul and similar soils: 6 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections "Use and Management of the Soils" and "Soil Properties."

## **FrkB—Frankirk silt loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Eastern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Frankirk and similar soils**

*Extent of the component in the map unit:* 85 percent

*Geomorphic setting:* Terraces on uplands

*Position on landform:* Treads

*Parent material:* Alluvium

*Slope:* 1 to 3 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 9.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—2e

Land capability classification, irrigated—2e

Ecological site number and name—078XY041OK, Hardland (north)

#### *Representative profile:*

Ap—0 to 7 inches; silt loam

BA—7 to 18 inches; silty clay loam

Bt—18 to 37 inches; silty clay loam

Btk—37 to 65 inches; silty clay loam

BCK—65 to 80 inches; loam

*Location of representative profile:* About 900 feet north and 2,400 feet east of the southwest corner of sec. 24, T. 29 N., R. 22 W.

### ***Minor Components***

- Farry and similar soils: 5 percent
- Quinlan and similar soils: 5 percent
- Selman and similar soils: 5 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **FtnB—Fortyone sandy loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Eastern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Fortyone and similar soils**

*Extent of the component in the map unit:* 90 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Summits

*Parent material:* Alluvium

*Slope:* 1 to 3 percent

*Runoff:* Very low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 4.8 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3s

Land capability classification, irrigated—2e

Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

A—0 to 7 inches; sandy loam

Bt1—7 to 13 inches; sandy loam

Bt2—13 to 21 inches; coarse sandy loam

C—21 to 80 inches; loamy coarse sand

*Location of representative profile:* About 1,800 feet north and 900 feet west of the southeast corner of sec. 29, T. 25 N., R. 21 W.

### ***Minor Components***

- Farry and similar soils: 6 percent
- Grandfield and similar soils: 4 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **FtnC—Fortyone sandy loam, 3 to 5 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Eastern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Fortyone and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Shoulders

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Very low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 6.7 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

A—0 to 8 inches; sandy loam

Bt—8 to 30 inches; sandy loam

BC—30 to 48 inches; coarse sandy loam

C—48 to 80 inches; gravelly sand

*Location of representative profile:* About 1,100 feet south and 600 feet west of the northeast corner of sec. 31, T. 25 N., R. 21 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **FtnD—Fortyone sandy loam, 5 to 8 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Eastern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Fortyone and similar soils**

*Extent of the component in the map unit:* 90 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 5 to 8 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 6.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4e

Land capability classification, irrigated—4e

Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

Ap—0 to 6 inches; sandy loam

Bt1—6 to 18 inches; loam

Bt2—18 to 27 inches; sandy loam

BC—27 to 39 inches; sandy loam

C—39 to 80 inches; sandy loam

*Location of representative profile:* About 2,600 feet south and 1,000 feet west of the northeast corner of sec. 28, T. 25 N., R. 21 W.

### ***Minor Components***

- Likes and similar soils: 10 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **GcsA—Gracemore fine sandy loam, 0 to 1 percent slopes, rarely flooded**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Along major rivers and streams

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Gracemore and similar soils**

*Extent of the component in the map unit:* 85 percent

*Geomorphic setting:* Flood plains in river valleys

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* High

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Somewhat poorly drained

*Available water capacity:* About 5.6 inches

*Depth to a seasonal high water table:* 0.5 to 2.1 feet

*Flooding:* Rare

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4w

Land capability classification, irrigated—4w

Ecological site number and name—078XY095OK, Subirrigated

*Representative profile:*

A—0 to 9 inches; fine sandy loam

C1—9 to 16 inches; loamy fine sand

C2—16 to 25 inches; fine sand

Ab—25 to 36 inches; clay loam

Cb—36 to 80 inches; fine sandy loam

*Location of representative profile:* About 800 feet south and 1,550 feet west of the northeast corner of sec. 16, T. 26 N., R. 25 W.

### ***Minor Components***

- Spur and similar soils: 10 percent
- Gracemont and similar soils: 5 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **GdfB—Grandfield fine sandy loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Southern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Grandfield and similar soils**

*Extent of the component in the map unit:* 94 percent

*Geomorphic setting:* Sand sheets on terraces on uplands

*Position on landform:* Summits

*Parent material:* Alluvium

*Slope:* 1 to 3 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 8.1 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—2e

Land capability classification, irrigated—2e

Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

Ap—0 to 12 inches; fine sandy loam

Btk1—12 to 47 inches; sandy clay loam

2Btk2—47 to 56 inches; clay loam

3Btk3—56 to 68 inches; sandy loam

3BC—68 to 94 inches; sandy loam

*Location of representative profile:* About 1,500 feet south and 400 feet east of the northwest corner of sec. 5, T. 27 N., R. 25 W. (fig. 7)

### ***Minor Components***

- Fortyone and similar soils: 3 percent
- Hardeman and similar soils: 3 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **GdfC—Grandfield fine sandy loam, 3 to 5 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Southern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Grandfield and similar soils**

*Extent of the component in the map unit:* 92 percent

*Geomorphic setting:* Sand sheets on terraces on uplands





Figure 7.—Profile of a soil in the Grandfield series.

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate



*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 8.2 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

A—0 to 8 inches; fine sandy loam

Bt1—8 to 25 inches; sandy clay loam

Bt2—25 to 43 inches; sandy clay loam

Bt3—43 to 61 inches; sandy clay loam

BC—61 to 80 inches; sandy loam

*Location of representative profile:* About 8,150 feet north and 300 feet west of the southeast corner of sec. 25, T. 25 N., R. 21 W.

### **Minor Components**

- Hardeman and similar soils: 8 percent

### **Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **GDGE—Grandfield-Devol-Grandmore complex, 1 to 12 percent slopes**

### **Map Unit Setting**

*Major land resource area:* 78C

*General location:* Southern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### **Major Component Description**

#### **Grandfield and similar soils**

*Extent of the component in the map unit:* 48 percent

*Geomorphic setting:* Sand sheets on terraces on uplands

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 5 to 8 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 8.0 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4e

Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

A—0 to 8 inches; loam

Bt1—8 to 16 inches; loam

Bt2—16 to 36 inches; clay loam

BCK—36 to 60 inches; loam

C—60 to 80 inches; fine sandy loam

*Location of representative profile:* About 3,500 feet north and 900 feet west of the southeast corner of sec. 24, T. 25 N., R. 22 W.

#### **Devol and similar soils**

*Extent of the component in the map unit:* 32 percent

*Geomorphic setting:* Dunes in dune fields on sandhills on uplands

*Position on landform:* Backslopes

*Parent material:* Eolian sands

*Slope:* 5 to 12 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 6.6 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

A—0 to 13 inches; fine sandy loam

Bt—13 to 29 inches; fine sandy loam

Bk1—29 to 38 inches; fine sandy loam

Bk2—38 to 45 inches; loamy fine sand

C—45 to 80 inches; loamy fine sand

*Location of representative profile:* About 3,400 feet north and 900 feet west of the southeast corner of sec. 24, T. 25 N., R. 22 W.

#### **Grandmore and similar soils**

*Extent of the component in the map unit:* 20 percent

*Geomorphic setting:* Sand sheets on terraces on uplands

*Position on landform:* Summits

*Parent material:* Alluvium

*Slope:* 1 to 3 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Moderately well drained

*Available water capacity:* About 8.7 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

A—0 to 15 inches; fine sandy loam

Bt—15 to 30 inches; fine sandy loam

2Btkb—30 to 54 inches; sandy clay loam

2BCb—54 to 70 inches; clay loam

2Cb—70 to 80 inches; fine sandy loam

*Location of representative profile:* About 3,000 feet north and 900 feet west of the southeast corner of sec. 24, T. 25 N., R. 22 W.

### ***Management***

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **GdmB—Grandmore fine sandy loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Southern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Grandmore and similar soils**

*Extent of the component in the map unit:* 86 percent

*Geomorphic setting:* Sand sheets on terraces on uplands

*Position on landform:* Summits

*Parent material:* Alluvium

*Slope:* 1 to 3 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Moderately well drained

*Available water capacity:* About 8.2 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

Ap—0 to 10 inches; fine sandy loam

Bt—10 to 22 inches; fine sandy loam

Btk1—22 to 34 inches; loam

Btk2—34 to 47 inches; loam

2Btkb—47 to 80 inches; sandy clay loam

*Location of representative profile:* About 2,500 feet south and 500 feet east of the northwest corner of sec. 12, T. 27 N., R. 26 W.

### **Minor Components**

- Hardeman and similar soils: 14 percent

### **Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **GfsA—Gracemore fine sandy loam, saline, 0 to 1 percent slopes, occasionally flooded**

### **Map Unit Setting**

*Major land resource area:* 78C

*General location:* Along major rivers and streams

*Elevation:* 1,600 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### **Major Component Description**

#### **Gracemore and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Flood plains in river valleys

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* High

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Somewhat poorly drained  
*Available water capacity:* About 4.2 inches  
*Depth to a seasonal high water table:* 0.5 to 2.5 feet  
*Flooding:* Occasional  
*Ponding:* None  
*Other properties:* Saline within a depth of 30 inches

*Interpretive groups:*  
Land capability classification, nonirrigated—4w  
Ecological site number and name—078XY097OK, Subirrigated (saline)

*Representative profile:*  
A—0 to 8 inches; fine sandy loam  
AC—8 to 22 inches; fine sand  
C—22 to 80 inches; fine sand

*Location of representative profile:* About 1,500 feet south and 3,100 feet west of the northeast corner of sec. 13, T. 27 N., R. 20 W.

### ***Management***

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **GmrA—Gracemont fine sandy loam, 0 to 1 percent slopes, rarely flooded**

### ***Map Unit Setting***

*Major land resource area:* 78C  
*General location:* Along major rivers and streams  
*Elevation:* 1,600 to 2,200 feet  
*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F  
*Frost-free period:* 185 to 200 days  
*Shape of individual mapped areas:* Irregular  
*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Gracemont and similar soils**

*Extent of the component in the map unit:* 91 percent  
*Geomorphic setting:* Flood plains in river valleys  
*Parent material:* Alluvium  
*Slope:* 0 to 1 percent  
*Runoff:* High  
*Soil depth:* More than 60 inches  
*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate  
*Slowest permeability class within a depth of 80 inches:* Moderate  
*Drainage class:* Poorly drained  
*Available water capacity:* About 9.2 inches  
*Depth to a seasonal high water table:* 0.5 to 1.5 feet  
*Flooding:* Rare  
*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4w

Land capability classification, irrigated—4w

Ecological site number and name—078XY095OK, Subirrigated

*Representative profile:*

A—0 to 7 inches; fine sandy loam

C1—7 to 29 inches; fine sandy loam

C2—29 to 45 inches; fine sandy loam

C3—45 to 80 inches; fine sandy loam

*Location of representative profile:* About 3,300 feet north and 225 feet west of the southeast corner of sec. 36, T. 26 N., R. 25 W.

**Minor Components**

- Spur and similar soils: 5 percent
- Lesho and similar soils: 4 percent

**Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **GmsA—Gracemont fine sandy loam, saline, 0 to 1 percent slopes, rarely flooded**

**Map Unit Setting**

*Major land resource area:* 78C

*General location:* Along major rivers and streams

*Elevation:* 1,600 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

**Major Component Description****Gracemont and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Flood plains in river valleys

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* High

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Poorly drained

*Available water capacity:* About 9.2 inches

*Depth to a seasonal high water table:* 0.5 to 1.5 feet

*Flooding:* Rare

*Ponding:* None

*Other properties:* Saline within a depth of 30 inches

*Interpretive groups:*

Land capability classification, nonirrigated—4w

Ecological site number and name—078XY097OK, Subirrigated (saline)

*Representative profile:*

A—0 to 7 inches; fine sandy loam

C—7 to 22 inches; fine sandy loam

Ab—22 to 31 inches; loam

Cb1—31 to 62 inches; clay loam

Cb2—62 to 80 inches; loamy sand

*Location of representative profile:* About 3,250 feet north and 1,900 feet east of the southwest corner of sec. 30, T. 29 N., R. 25 W.

***Management****Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **GrmA—Gracemore fine sandy loam, saline, 0 to 1 percent slopes, rarely flooded**

***Map Unit Setting****Major land resource area:* 78C*General location:* Along major rivers and streams*Elevation:* 1,600 to 2,200 feet*Mean annual precipitation:* 22 to 24 inches*Mean annual air temperature:* 57 to 59 degrees F*Frost-free period:* 185 to 200 days*Shape of individual mapped areas:* Irregular*Size of areas:* 10 to 200 acres***Major Component Description*****Gracemore and similar soils***Extent of the component in the map unit:* 95 percent*Geomorphic setting:* Flood plains in river valleys*Parent material:* Alluvium*Slope:* 0 to 1 percent*Runoff:* High*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate*Drainage class:* Somewhat poorly drained*Available water capacity:* About 4.6 inches*Depth to a seasonal high water table:* 0.5 to 2.1 feet*Flooding:* Rare*Ponding:* None*Other properties:* Saline within a depth of 30 inches*Interpretive groups:*

Land capability classification, nonirrigated—4w

Ecological site number and name—078XY097OK, Subirrigated (saline)



*Representative profile:*

A—0 to 13 inches; fine sandy loam  
 C1—13 to 20 inches; loamy fine sand  
 C2—20 to 30 inches; fine sand  
 Ab—30 to 49 inches; clay loam  
 Cb—49 to 80 inches; fine sandy loam

*Location of representative profile:* About 100 feet north and 1,500 feet east of the southwest corner of sec. 16, T. 26 N., R. 25 W.

**Minor Components**

- Gracemont and similar soils: 5 percent

**Management**

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **HdGB—Hardeman-Grandmore complex, 1 to 3 percent slopes**

**Map Unit Setting**

*Major land resource area:* 78C

*General location:* Southern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

**Major Component Description****Hardeman and similar soils**

*Extent of the component in the map unit:* 60 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Summits

*Parent material:* Alluvium

*Slope:* 1 to 3 percent

*Runoff:* Very low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
 Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 7.7 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

A—0 to 7 inches; loamy sand  
Bw1—7 to 18 inches; loamy coarse sand  
Bw2—18 to 37 inches; sandy loam  
Ab—37 to 47 inches; loamy sand  
Bwb—47 to 106 inches; loamy sand

*Location of representative profile:* About 600 feet north and 4,200 feet east of the southwest corner of sec. 18, T. 25 N., R. 22 W.

**Grandmore and similar soils**

*Extent of the component in the map unit:* 40 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Summits and shoulders

*Parent material:* Alluvium

*Slope:* 1 to 3 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Moderately well drained

*Available water capacity:* About 8.1 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

A—0 to 18 inches; fine sandy loam  
Bt—18 to 27 inches; fine sandy loam  
Btk—27 to 49 inches; sandy clay loam  
2Btkb—49 to 60 inches; clay loam  
2Cb—60 to 80 inches; clay loam

*Location of representative profile:* About 600 feet north and 3,550 feet east of the southwest corner of sec. 18, T. 25 N., R. 22 W.

**Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**HdGC—Hardeman-Grandmore complex, 3 to 5 percent slopes****Map Unit Setting**

*Major land resource area:* 78C

*General location:* Southern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Hardeman and similar soils**

*Extent of the component in the map unit:* 70 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Very low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 7.7 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

A1—0 to 6 inches; fine sandy loam

A2—6 to 13 inches; fine sandy loam

Bw—13 to 24 inches; fine sandy loam

Bk—24 to 48 inches; fine sandy loam

C—48 to 80 inches; fine sandy loam

*Location of representative profile:* About 650 feet south and 1,675 feet west of the northeast corner of sec. 33, T. 25 N., R. 21 W.

#### **Grandmore and similar soils**

*Extent of the component in the map unit:* 25 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Shoulders and backslopes

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Moderately well drained

*Available water capacity:* About 8.7 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

A—0 to 15 inches; fine sandy loam

Bt—15 to 30 inches; fine sandy loam

2Btkb—30 to 54 inches; sandy clay loam

2BCb—54 to 70 inches; clay loam

2Cb—70 to 80 inches; fine sandy loam

*Location of representative profile:* About 650 feet south and 1,675 feet west of the northeast corner of sec. 33, T. 25 N., R. 21 W.

**Minor Components**

- Vernon and similar soils: 5 percent

**Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**HdmB—Hardeman fine sandy loam, 1 to 3 percent slopes**

**Map Unit Setting**

*Major land resource area:* 78C

*General location:* Southern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

**Major Component Description**

**Hardeman and similar soils**

*Extent of the component in the map unit:* 85 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Footslopes

*Parent material:* Alluvium

*Slope:* 1 to 3 percent

*Runoff:* Very low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 7.7 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

Ap—0 to 9 inches; fine sandy loam

Bw—9 to 24 inches; fine sandy loam

Bk1—24 to 42 inches; fine sandy loam

Bk2—42 to 53 inches; fine sandy loam

C—53 to 80 inches; fine sandy loam

*Location of representative profile:* About 1,400 feet south and 1,700 feet east of the northwest corner of sec. 1, T. 27 N., R. 25 W.

**Minor Components**

- Abbie and similar soils: 6 percent
- Grandmore and similar soils: 6 percent
- Paloduro and similar soils: 3 percent

**Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections "Use and Management of the Soils" and "Soil Properties."

**HdmC—Hardeman fine sandy loam, 3 to 5 percent slopes****Map Unit Setting**

*Major land resource area:* 78C

*General location:* Southern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

**Major Component Description****Hardeman and similar soils**

*Extent of the component in the map unit:* 90 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Very low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 7.7 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

A—0 to 9 inches; fine sandy loam

Bw—9 to 27 inches; fine sandy loam

Bk1—27 to 34 inches; fine sandy loam

Bk2—34 to 59 inches; fine sandy loam

C—59 to 80 inches; fine sandy loam

*Location of representative profile:* About 2,100 feet north and 100 feet west of the southeast corner of sec. 2, T. 27 N., R. 25 W.

**Minor Components**

- Abbie and similar soils: 6 percent
- Grandfield and similar soils: 4 percent

**Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**IreA—Irene silt loam, 0 to 1 percent slopes****Map Unit Setting**

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

**Major Component Description****Irene and similar soils**

*Extent of the component in the map unit:* 97 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Summits

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 11.1 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—1

Land capability classification, irrigated—1

Ecological site number and name—077EY056OK, Loamy Prairie

*Representative profile:*

Ap—0 to 8 inches; silt loam

BA—8 to 14 inches; silt loam

Bt—14 to 23 inches; silty clay loam

Btk—23 to 49 inches; silty clay loam

Bk—49 to 80 inches; silt loam

*Location of representative profile:* About 400 feet south and 300 feet east of the northwest corner of sec. 13, T. 28 N., R. 26 W.

**Minor Components**

- Paloduro and similar soils: 3 percent

**Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**IreB—Irene silt loam, 1 to 3 percent slopes****Map Unit Setting**

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

**Major Component Description****Irene and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Summits

*Parent material:* Alluvium

*Slope:* 1 to 3 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 11.4 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—2e

Land capability classification, irrigated—2e

Ecological site number and name—077EY056OK, Loamy Prairie



*Representative profile:*

Ap—0 to 9 inches; silt loam

Bk—9 to 14 inches; silt loam

Btk1—14 to 29 inches; silty clay loam

Btk2—29 to 44 inches; silty clay loam

Bt—44 to 80 inches; silty clay loam

*Location of representative profile:* About 100 feet north and 1,450 feet west of the southeast corner of sec. 12, T. 25 N., R. 21 W.

***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**IreC—Irene silt loam, 3 to 5 percent slopes*****Map Unit Setting***

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

***Major Component Description*****Irene and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Shoulders

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 11.4 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—077EY056OK, Loamy Prairie

*Representative profile:*

Ap—0 to 15 inches; silt loam

Bt—15 to 23 inches; silty clay loam

Btk1—23 to 46 inches; silty clay loam

Btk2—46 to 59 inches; silt loam

Bk—59 to 80 inches; silt loam

*Location of representative profile:* About 300 feet south and 1,250 feet west of the northeast corner of sec. 30, T. 25 N., R. 21 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **IreD—Irene silt loam, 5 to 8 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Irene and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 5 to 8 percent

*Runoff:* High

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 11.2 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—4e

Land capability classification, irrigated—4e

Ecological site number and name—077EY056OK, Loamy Prairie

#### *Representative profile:*

Ap—0 to 11 inches; silt loam

Btk1—11 to 22 inches; silty clay loam

Btk2—22 to 36 inches; silty clay loam

BCK—36 to 51 inches; silty clay loam

C—51 to 80 inches; silt loam

*Location of representative profile:* About 900 feet north and 1,800 feet west of the southeast corner of sec. 18, T. 28 N., R. 25 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **JssF—Jester sand, 5 to 12 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Along major rivers and streams

*Elevation:* 1,600 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 300 acres

### ***Major Component Description***

#### **Jester and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Dunes on sandhills in river valleys

*Parent material:* Eolian sands

*Slope:* 5 to 12 percent

*Runoff:* Very low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Rapid

*Slowest permeability class within a depth of 80 inches:* Rapid

*Drainage class:* Excessively drained

*Available water capacity:* About 3.1 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—078XY022OK, Dune

#### *Representative profile:*

A—0 to 5 inches; sand

AC—5 to 16 inches; sand

C1—16 to 42 inches; sand

2C2—42 to 57 inches; stratified sand

2C3—57 to 80 inches; stratified sand

*Location of representative profile:* About 1,900 feet north and 2,000 feet west of the southeast corner of sec. 32, T. 25 N., R. 22 W.

### ***Management***

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **JstC—Jester loamy fine sand, 1 to 5 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Along major rivers and streams

*Elevation:* 1,600 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 300 acres

### ***Major Component Description***

#### **Jester and similar soils**

*Extent of the component in the map unit:* 94 percent

*Geomorphic setting:* Dunes on sandhills in river valleys

*Parent material:* Eolian sands

*Slope:* 1 to 5 percent

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Rapid

*Slowest permeability class within a depth of 80 inches:* Rapid

*Drainage class:* Excessively drained

*Available water capacity:* About 3.2 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4e

Ecological site number and name—078XY014OK, Deep Sand

*Representative profile:*

A—0 to 7 inches; loamy fine sand

C1—7 to 40 inches; loamy fine sand

C2—40 to 80 inches; fine sand

*Location of representative profile:* About 900 feet north and 10 feet west of the southeast corner of sec. 36, T. 27 N., R. 21 W.

### ***Minor Components***

- Westola and similar soils: 6 percent

### ***Management***

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **KidB—Kingsdown fine sandy loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Northern part of the county

*Elevation:* 1,800 to 2,200 feet  
*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F  
*Frost-free period:* 185 to 200 days  
*Shape of individual mapped areas:* Irregular  
*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Kingsdown and similar soils**

*Extent of the component in the map unit:* 100 percent  
*Geomorphic setting:* Paleoterraces in river valleys  
*Position on landform:* Footslopes  
*Parent material:* Alluvium  
*Slope:* 1 to 3 percent  
*Runoff:* Very low  
*Soil depth:* More than 60 inches  
*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate  
*Slowest permeability class within a depth of 80 inches:* Moderate  
*Drainage class:* Well drained  
*Available water capacity:* About 9.3 inches  
*Depth to a seasonal high water table:* More than 6 feet  
*Flooding:* None  
*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—2e  
Land capability classification, irrigated—2e  
Ecological site number and name—078XY073OK, Sandy Prairie

#### *Representative profile:*

A—0 to 14 inches; fine sandy loam  
Bk1—14 to 23 inches; fine sandy loam  
Bk2—23 to 32 inches; fine sandy loam  
Bk3—32 to 43 inches; fine sandy loam  
C—43 to 80 inches; fine sandy loam

*Location of representative profile:* About 1,000 feet south and 2,700 feet west of the northeast corner of sec. 22, T. 26 N., R. 26 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **KiHE—Kingsdown-Hardeman complex, 0 to 12 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C  
*General location:* Northwestern part of the county  
*Elevation:* 1,800 to 2,200 feet  
*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days  
*Shape of individual mapped areas:* Irregular  
*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Kingsdown and similar soils**

*Extent of the component in the map unit:* 60 percent  
*Geomorphic setting:* Drainageways on uplands  
*Position on landform:* Shoulders  
*Parent material:* Alluvium  
*Slope:* 1 to 8 percent  
*Runoff:* Low  
*Soil depth:* More than 60 inches  
*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate  
*Slowest permeability class within a depth of 80 inches:* Moderate  
*Drainage class:* Well drained  
*Available water capacity:* About 8.8 inches  
*Depth to a seasonal high water table:* More than 6 feet  
*Flooding:* None  
*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—4e  
Ecological site number and name—078XY073OK, Sandy Prairie

#### *Representative profile:*

A—0 to 10 inches; loam  
Bk1—10 to 25 inches; loam  
Bk2—25 to 38 inches; sandy loam  
C—38 to 80 inches; coarse sandy loam

*Location of representative profile:* About 2,500 feet south and 2,300 feet east of the northwest corner of sec. 28, T. 28 N., R. 25 W.

#### **Hardeman and similar soils**

*Extent of the component in the map unit:* 35 percent  
*Geomorphic setting:* Drainageways on uplands  
*Position on landform:* Backslopes  
*Parent material:* Alluvium  
*Slope:* 0 to 12 percent  
*Runoff:* Low  
*Soil depth:* More than 60 inches  
*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderately rapid  
*Slowest permeability class within a depth of 80 inches:* Moderately rapid  
*Drainage class:* Well drained  
*Available water capacity:* About 7.7 inches  
*Depth to a seasonal high water table:* More than 6 feet  
*Flooding:* None  
*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—6e  
Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

A—0 to 6 inches; loam

Bk1—6 to 16 inches; loam

Bk2—16 to 39 inches; fine sandy loam

C—39 to 80 inches; fine sandy loam

*Location of representative profile:* About 2,500 feet south and 2,000 feet east of the northwest corner of sec. 28, T. 28 N., R. 25 W.

**Minor Components**

- Grandfield and similar soils: 5 percent

**Management**

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **LgtA—Lugert silt loam, 0 to 1 percent slopes, occasionally flooded**

**Map Unit Setting**

*Major land resource area:* 78C

*General location:* In drainageways in the northern part of the county

*Elevation:* 1,600 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

**Major Component Description****Lugert and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Flood plains in river valleys

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 11.0 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* Occasional

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—2w

Ecological site number and name—078XY050OK, Loamy Bottomland

*Representative profile:*

A—0 to 11 inches; silt loam



Bk—11 to 36 inches; very fine sandy loam  
Ckz—36 to 48 inches; very fine sandy loam  
Az b—48 to 69 inches; loam  
Cz b—69 to 88 inches; loam

*Location of representative profile:* About 50 feet south and 200 feet west of the northeast corner of sec. 21, T. 29 N., R. 23 W. (fig. 8)



Figure 8.—Profile of a soil in the Lugert series.

### ***Management***

*Major uses:* Rangeland and cropland (fig. 9)

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **LiJC—Lincoln-Jester complex, 0 to 5 percent slopes, rarely flooded**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Along major rivers and streams

*Elevation:* 1,600 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 20 to 500 acres

### ***Major Component Description***

#### **Lincoln and similar soils**

*Extent of the component in the map unit:* 51 percent

*Geomorphic setting:* Flood plains in river valleys

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Rapid



**Figure 9.—Native pasture and cottonwood trees in an area of Lugert silt loam, 0 to 1 percent slopes, occasionally flooded.**

*Slowest permeability class within a depth of 80 inches:* Rapid

*Drainage class:* Somewhat excessively drained

*Available water capacity:* About 3.8 inches

*Depth to a seasonal high water table:* 5.0 to 6.7 feet

*Flooding:* Rare

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3s

Ecological site number and name—078XY068OK, Sandy Bottomland

*Representative profile:*

A—0 to 11 inches; fine sandy loam

C1—11 to 19 inches; loamy fine sand

C2—19 to 80 inches; loamy coarse sand

*Location of representative profile:* About 3,550 feet north and 2,450 feet west of the southeast corner of sec. 24, T. 29 N., R. 26 W.

### **Jester and similar soils**

*Extent of the component in the map unit:* 49 percent

*Geomorphic setting:* Dunes on sandhills in river valleys

*Parent material:* Eolian sands

*Slope:* 1 to 5 percent

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Rapid

*Slowest permeability class within a depth of 80 inches:* Rapid

*Drainage class:* Excessively drained

*Available water capacity:* About 3.2 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* Rare

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4e

Ecological site number and name—078XY014OK, Deep Sand

*Representative profile:*

A—0 to 6 inches; loamy fine sand

C1—6 to 19 inches; loamy fine sand

C2—19 to 30 inches; loamy fine sand

C3—30 to 80 inches; loamy fine sand

*Location of representative profile:* About 3,150 feet north and 2,450 feet west of the southeast corner of sec. 24, T. 29 N., R. 26 W.

### **Management**

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **LikB—Likes fine sandy loam, 1 to 3 percent slopes**

### **Map Unit Setting**

*Major land resource area:* 77E

*General location:* Along major rivers and streams



*Elevation:* 2,100 to 2,450 feet  
*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F  
*Frost-free period:* 185 to 200 days  
*Shape of individual mapped areas:* Irregular  
*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Likes and similar soils**

*Extent of the component in the map unit:* 100 percent  
*Geomorphic setting:* Sand sheets on terraces in river valleys  
*Position on landform:* Summits  
*Parent material:* Alluvium  
*Slope:* 1 to 3 percent  
*Runoff:* Negligible  
*Soil depth:* More than 60 inches  
*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Rapid  
*Slowest permeability class within a depth of 80 inches:* Rapid  
*Drainage class:* Excessively drained  
*Available water capacity:* About 3.0 inches  
*Depth to a seasonal high water table:* More than 6 feet  
*Flooding:* None  
*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—3s  
Land capability classification, irrigated—3e  
Ecological site number and name—077EY014OK, Deep Sand

#### *Representative profile:*

A—0 to 7 inches; fine sandy loam  
BC—7 to 16 inches; loamy fine sand  
Bck1—16 to 28 inches; loamy fine sand  
Bck2—28 to 42 inches; loamy fine sand  
C—42 to 80 inches; loamy fine sand

*Location of representative profile:* About 6,500 feet south and 4,300 feet west of the northeast corner of sec. 29, T. 26 N., R. 24 W.

### ***Management***

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **LisA—Lincoln sand, 0 to 1 percent slopes, frequently flooded**

### ***Map Unit Setting***

*Major land resource area:* 78C  
*General location:* Along major rivers and streams  
*Elevation:* 1,600 to 2,200 feet  
*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days  
*Shape of individual mapped areas:* Irregular  
*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Lincoln and similar soils**

*Extent of the component in the map unit:* 100 percent  
*Geomorphic setting:* Flood plains in river valleys  
*Parent material:* Alluvium  
*Slope:* 0 to 1 percent  
*Runoff:* Negligible  
*Soil depth:* More than 60 inches  
*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
 Rapid  
*Slowest permeability class within a depth of 80 inches:* Rapid  
*Drainage class:* Somewhat excessively drained  
*Available water capacity:* About 3.3 inches  
*Depth to a seasonal high water table:* 5.0 to 6.7 feet  
*Flooding:* Frequent  
*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—5w  
 Ecological site number and name—078XY068OK, Sandy Bottomland

#### *Representative profile:*

A—0 to 4 inches; sand  
 C1—4 to 10 inches; loamy fine sand  
 C2—10 to 80 inches; sand

*Location of representative profile:* About 4,050 feet north and 5,200 feet west of the southeast corner of sec. 36, T. 27 N., R. 26 W.

### ***Management***

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **LncA—Lincoln clay loam, 0 to 1 percent slopes, rarely flooded**

### ***Map Unit Setting***

*Major land resource area:* 78C  
*General location:* Along major rivers and streams  
*Elevation:* 1,600 to 2,200 feet  
*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F  
*Frost-free period:* 185 to 200 days  
*Shape of individual mapped areas:* Irregular  
*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Lincoln and similar soils**

*Extent of the component in the map unit:* 100 percent  
*Geomorphic setting:* Flood plains in river valleys

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Slow

*Slowest permeability class within a depth of 80 inches:* Slow

*Drainage class:* Somewhat excessively drained

*Available water capacity:* About 4.0 inches

*Depth to a seasonal high water table:* 5.0 to 6.7 feet

*Flooding:* Rare

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3s

Land capability classification, irrigated—2e

Ecological site number and name—078XY050OK, Loamy Bottomland

*Representative profile:*

A—0 to 8 inches; clay loam

C1—8 to 19 inches; loamy fine sand

C2—19 to 28 inches; loamy fine sand

C3—28 to 34 inches; loamy fine sand

C4—34 to 80 inches; loamy coarse sand

*Location of representative profile:* About 4,500 feet south and 3,100 feet west of the northeast corner of sec. 13, T. 29 N., R. 26 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **LReE—Laverne-Rock outcrop complex, 1 to 12 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Laverne and similar soils**

*Extent of the component in the map unit:* 70 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Summits

*Parent material:* Residuum

*Slope:* 1 to 12 percent

*Runoff:* Very high

*Soil depth:* 4 to 20 inches to petrocalcic material

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Slow

*Drainage class:* Well drained

*Available water capacity:* About 1.8 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—7s

Ecological site number and name—077XY082OK, Shallow

*Representative profile:*

A—0 to 8 inches; loam

Bk—8 to 15 inches; gravelly loam

2Bkm—15 to 25 inches; bedrock

*Location of representative profile:* About 100 feet north and 3,900 feet east of the southwest corner of sec. 31, T. 25 N., R. 25 W.

### **Rock outcrop**

*Extent of the component in the map unit:* 20 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Shoulders

*Slope:* 1 to 12 percent

*Runoff:* Very high

*Soil depth:* 0 to 3 inches to lithic bedrock

*Interpretive groups:*

Land capability classification, nonirrigated—8

*Location of representative area:* About 400 feet north and 3,900 feet east of the southwest corner of sec. 31, T. 25 N., R. 25 W.

### **Minor Components**

- Plemons and similar soils: 10 percent

### **Management**

*Major uses:* Rangeland (fig. 10)

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **LshA—Lesho clay loam, 0 to 1 percent slopes, rarely flooded**

### **Map Unit Setting**

*Major land resource area:* 78C

*General location:* Along major rivers and streams

*Elevation:* 1,600 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres





Figure 10.—Native short grasses in an area of Laverne-Rock outcrop complex, 1 to 12 percent slopes. The rock outcrop is on the barren side slopes.

### ***Major Component Description***

#### **Lesho and similar soils**

*Extent of the component in the map unit:* 83 percent

*Geomorphic setting:* Flood plains in river valleys

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Somewhat poorly drained

*Available water capacity:* About 7.6 inches

*Depth to a seasonal high water table:* 2.0 to 4.0 feet

*Flooding:* Rare

*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—2e

Ecological site number and name—078XY095OK, Subirrigated

#### *Representative profile:*

A—0 to 11 inches; clay loam

C1—11 to 17 inches; clay loam

C2—17 to 23 inches; fine sandy loam

C3—23 to 34 inches; clay loam

2C—34 to 80 inches; loamy coarse sand

*Location of representative profile:* About 2,700 feet north and 1,600 feet west of the southeast corner of sec. 6, T. 26 N., R. 25 W.

### ***Minor Components***

- Jester and similar soils: 7 percent
- Westola and similar soils: 7 percent
- Lincoln and similar soils: 3 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections "Use and Management of the Soils" and "Soil Properties."

## **LsoA—Lincoln sand, 0 to 1 percent slopes, occasionally flooded**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Along major rivers and streams

*Elevation:* 1,600 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Lincoln and similar soils**

*Extent of the component in the map unit:* 83 percent

*Geomorphic setting:* Flood plains in river valleys

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Rapid

*Slowest permeability class within a depth of 80 inches:* Rapid

*Drainage class:* Somewhat excessively drained

*Available water capacity:* About 3.5 inches

*Depth to a seasonal high water table:* 5.0 to 6.7 feet

*Flooding:* Occasional

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3s

Ecological site number and name—078XY068OK, Sandy Bottomland

*Representative profile:*

A—0 to 7 inches; sand

AC—7 to 20 inches; fine sand

C1—20 to 31 inches; sand

C2—31 to 48 inches; fine sand

C3—48 to 80 inches; stratified fine sand to clay loam

*Location of representative profile:* About 1,400 feet north and 1,500 feet east of the southwest corner of sec. 31, T. 26 N., R. 24 W.

#### ***Minor Components***

- Westola and similar soils: 9 percent
- Jester and similar soils: 8 percent

#### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections "Use and Management of the Soils" and "Soil Properties."

### **M-W—Miscellaneous water**

#### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,600 to 2,450 feet

*Mean annual precipitation:* 22 to 26 inches

*Mean annual air temperature:* 55 to 59 degrees F

#### ***Major Component Description***

##### **Water**

*Extent of the component in the map unit:* 100 percent

*Location of representative area:* About 500 feet north and 2,000 feet west of the southeast corner of sec. 22, T. 26 N., R. 25 W.

### **MLBB—Mobeetie-Likes-Berda complex, 1 to 3 percent slopes**

#### ***Map Unit Setting***

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 20 to 800 acres

#### ***Major Component Description***

##### **Mobeetie and similar soils**

*Extent of the component in the map unit:* 45 percent

*Geomorphic setting:* Hillslopes on hills on uplands

*Position on landform:* Summits

*Parent material:* Alluvium

*Slope:* 1 to 3 percent

*Runoff:* Very low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 7.1 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

A—0 to 6 inches; loam

Bw—6 to 11 inches; loam

Bk—11 to 21 inches; fine sandy loam

BCK—21 to 34 inches; loam

C—34 to 80 inches; loamy coarse sand

*Location of representative profile:* About 2,500 feet north and 1,500 feet east of the southwest corner of sec. 14, T. 25 N., R. 25 W.

#### **Likes and similar soils**

*Extent of the component in the map unit:* 22 percent

*Geomorphic setting:* Dunes on sandhills on uplands

*Position on landform:* Backslopes

*Parent material:* Eolian sands

*Slope:* 1 to 3 percent

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Rapid

*Slowest permeability class within a depth of 80 inches:* Rapid

*Drainage class:* Excessively drained

*Available water capacity:* About 3.0 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—077EY014OK, Deep Sand

*Representative profile:*

A—0 to 5 inches; loamy sand

BC—5 to 11 inches; fine sandy loam

BCK—11 to 80 inches; loamy coarse sand

*Location of representative profile:* About 2,500 feet north and 1,500 feet east of the southwest corner of sec. 14, T. 25 N., R. 25 W.

#### **Berda and similar soils**

*Extent of the component in the map unit:* 21 percent

*Geomorphic setting:* Hillslopes on hills on uplands

*Position on landform:* Summits

*Parent material:* Alluvium

*Slope:* 1 to 3 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 8.1 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

A—0 to 8 inches; loam

Bw—8 to 15 inches; gravelly fine sandy loam

Bk1—15 to 28 inches; clay loam

Bk2—28 to 34 inches; clay loam

C—34 to 80 inches; loamy fine sand

*Location of representative profile:* About 2,500 feet north and 1,500 feet east of the southwest corner of sec. 14, T. 25 N., R. 25 W.

### ***Minor Components***

- Woods and similar soils: 6 percent
- Laverne and similar soils: 2 percent
- Quinlan and similar soils: 2 percent
- Rock outcrop: 2 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **MLBC—Mobeetie-Likes-Berda complex, 3 to 5 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 20 to 800 acres

### ***Major Component Description***

#### **Mobeetie and similar soils**

*Extent of the component in the map unit:* 45 percent

*Geomorphic setting:* Hillslopes on hills on uplands

*Position on landform:* Shoulders

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Very low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 7.1 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

A—0 to 6 inches; fine sandy loam

Bk1—6 to 19 inches; fine sandy loam

Bk2—19 to 25 inches; loamy coarse sand

Bk3—25 to 36 inches; fine sandy loam

C—36 to 80 inches; loamy coarse sand

*Location of representative profile:* About 1,100 feet north and 800 feet west of the southeast corner of sec. 34, T. 26 N., R. 26 W.

#### **Likes and similar soils**

*Extent of the component in the map unit:* 22 percent

*Geomorphic setting:* Dunes on sandhills on uplands

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Rapid

*Slowest permeability class within a depth of 80 inches:* Rapid

*Drainage class:* Excessively drained

*Available water capacity:* About 3.0 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—077EY014OK, Deep Sand

*Representative profile:*

A—0 to 7 inches; fine sandy loam

Bck1—7 to 18 inches; loamy coarse sand

Bck2—18 to 80 inches; loamy coarse sand

*Location of representative profile:* About 1,100 feet north and 500 feet west of the southeast corner of sec. 34, T. 26 N., R. 26 W.

**Berda and similar soils**

*Extent of the component in the map unit:* 21 percent

*Geomorphic setting:* Hillslopes on hills on uplands

*Position on landform:* Shoulders

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 8.1 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

A—0 to 6 inches; fine sandy loam

Bw—6 to 15 inches; gravelly fine sandy loam

Bk1—15 to 27 inches; clay loam

Bk2—27 to 34 inches; clay loam

C—34 to 80 inches; loamy fine sand

*Location of representative profile:* About 1,100 feet north and 400 feet west of the southeast corner of sec. 34, T. 26 N., R. 26 W.

**Minor Components**

- Woods and similar soils: 6 percent
- Laverne and similar soils: 2 percent
- Quinlan and similar soils: 2 percent
- Rock outcrop: 2 percent

**Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**MLBE—Mobeetie-Likes-Berda complex, 5 to 12 percent slopes****Map Unit Setting**

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 20 to 800 acres



### ***Major Component Description***

#### **Mobeetie and similar soils**

*Extent of the component in the map unit:* 45 percent

*Geomorphic setting:* Hillslopes on hills on uplands

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 5 to 12 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 7.1 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

A—0 to 5 inches; fine sandy loam

Bk1—5 to 12 inches; fine sandy loam

Bk2—12 to 23 inches; fine sandy loam

Bk3—23 to 39 inches; sandy loam

C—39 to 80 inches; loamy coarse sand

*Location of representative profile:* About 4,150 feet north and 5,500 feet west of the southeast corner of sec. 34, T. 26 N., R. 26 W.

#### **Likes and similar soils**

*Extent of the component in the map unit:* 22 percent

*Geomorphic setting:* Dunes on sandhills on uplands

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 5 to 12 percent

*Runoff:* Very low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Rapid

*Slowest permeability class within a depth of 80 inches:* Rapid

*Drainage class:* Excessively drained

*Available water capacity:* About 3.0 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—077EY014OK, Deep Sand

*Representative profile:*

A—0 to 6 inches; fine sandy loam

BC—6 to 11 inches; loamy fine sand

BCK1—11 to 27 inches; loamy fine sand  
BCK2—27 to 80 inches; loamy coarse sand

*Location of representative profile:* About 4,150 feet north and 5,000 feet west of the southeast corner of sec. 34, T. 26 N., R. 26 W.

**Berda and similar soils**

*Extent of the component in the map unit:* 21 percent

*Geomorphic setting:* Hillslopes on hills on uplands

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 5 to 12 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 8.2 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

A—0 to 5 inches; fine sandy loam

Bw—5 to 12 inches; fine sandy loam

Bk1—12 to 29 inches; sandy clay loam

Bk2—29 to 39 inches; clay loam

C—39 to 80 inches; loamy coarse sand

*Location of representative profile:* About 4,150 feet north and 5,200 feet west of the southeast corner of sec. 34, T. 26 N., R. 26 W.

**Minor Components**

- Woods and similar soils: 6 percent
- Laverne and similar soils: 2 percent
- Quinlan and similar soils: 2 percent
- Rock outcrop: 2 percent

**Management**

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**MnsB—Mansic clay loam, 1 to 3 percent slopes**

**Map Unit Setting**

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days  
*Shape of individual mapped areas:* Irregular  
*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Mansic and similar soils**

*Extent of the component in the map unit:* 94 percent  
*Geomorphic setting:* Hillslopes on hills on uplands  
*Position on landform:* Shoulders  
*Parent material:* Alluvium  
*Slope:* 1 to 3 percent  
*Runoff:* Low  
*Soil depth:* More than 60 inches  
*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
 Moderate  
*Slowest permeability class within a depth of 80 inches:* Moderate  
*Drainage class:* Well drained  
*Available water capacity:* About 10.5 inches  
*Depth to a seasonal high water table:* More than 6 feet  
*Flooding:* None  
*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—2e  
 Land capability classification, irrigated—2e  
 Ecological site number and name—077EY048OK, Limy Upland

#### *Representative profile:*

A—0 to 14 inches; clay loam  
 Bw—14 to 23 inches; clay loam  
 Bk—23 to 35 inches; clay loam  
 BCk—35 to 40 inches; loam  
 C—40 to 80 inches; loam

*Location of representative profile:* About 700 feet south and 100 feet east of the northwest corner of sec. 32, T. 28 N., R. 25 W.

### ***Minor Components***

- Mobeetie and similar soils: 6 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **MnsC—Mansic clay loam, 3 to 5 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 77E  
*General location:* Western part of the county  
*Elevation:* 2,100 to 2,450 feet  
*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F  
*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Mansic and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Hillslopes on hills on uplands

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 10.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

A—0 to 7 inches; clay loam

Bk—7 to 21 inches; clay loam

Bck—21 to 36 inches; loam

C—36 to 80 inches; loam

*Location of representative profile:* About 75 feet south and 1,300 feet west of the northeast corner of sec. 2, T. 27 N., R. 25 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **MsnB—Manson loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Manson and similar soils**

*Extent of the component in the map unit:* 95 percent

*Geomorphic setting:* Terraces on uplands

*Position on landform:* Treads

*Parent material:* Alluvium

*Slope:* 1 to 3 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 8.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—2e

Land capability classification, irrigated—2e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

A—0 to 7 inches; loam

Bw—7 to 13 inches; loam

Btk1—13 to 23 inches; sandy clay loam

Btk2—23 to 41 inches; sandy clay loam

Btk3—41 to 80 inches; sandy clay loam

*Location of representative profile:* About 4,100 feet south and 250 feet east of the northwest corner of sec. 2, T. 25 N., R. 26 W.

### ***Minor Components***

- Mobeetie and similar soils: 5 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **MsnC—Manson loam, 3 to 5 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Manson and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Terraces on uplands

*Position on landform:* Risers

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 8.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

A—0 to 11 inches; loam

Bw—11 to 19 inches; sandy clay loam

Btk1—19 to 35 inches; clay loam

Btk2—35 to 66 inches; clay loam

BC—66 to 80 inches; gravelly clay loam

*Location of representative profile:* About 650 feet north and 800 feet west of the southeast corner of sec. 33, T. 25 N., R. 26 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **MsnC2—Manson loam, 3 to 5 percent slopes, eroded**

### ***Map Unit Setting***

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Manson and similar soils**

*Extent of the component in the map unit:* 95 percent

*Geomorphic setting:* Terraces on uplands

*Position on landform:* Risers

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 8.2 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—077EY848OK, Reseeded Limy Upland

*Representative profile:*

A—0 to 12 inches; loam

Bt—12 to 30 inches; clay loam

Btk1—30 to 44 inches; clay loam

Btk2—44 to 55 inches; clay loam

Btk3—55 to 80 inches; clay loam

*Location of representative profile:* About 2,800 feet south and 1,650 feet west of the northeast corner of sec. 26, T. 25 N., R. 26 W.

### ***Minor Components***

- Woods and similar soils: 5 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **OMBE—Oklark-Mansic-Berda complex, 5 to 12 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 300 acres

### ***Major Component Description***

#### **Oklark and similar soils**

*Extent of the component in the map unit:* 43 percent

*Geomorphic setting:* Hillslopes on hills on uplands

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 5 to 12 percent

*Runoff:* Medium



*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 9.1 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—077EY049OK, Limy Sandy Plains

*Representative profile:*

A—0 to 10 inches; sandy loam

Bw—10 to 28 inches; sandy loam

Bk1—28 to 41 inches; sandy loam

Bk2—41 to 80 inches; sandy loam

*Location of representative profile:* About 2,375 feet north and 2,000 feet west of the southeast corner of sec. 29, T. 28 N., R. 25 W.

#### **Mansic and similar soils**

*Extent of the component in the map unit:* 27 percent

*Geomorphic setting:* Hillslopes on hills on uplands

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 5 to 12 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 9.5 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

A—0 to 12 inches; loam

Btk1—12 to 28 inches; clay loam

Btk2—28 to 56 inches; clay loam

C—56 to 80 inches; loam

*Location of representative profile:* About 2,175 feet north and 2,000 feet west of the southeast corner of sec. 29, T. 28 N., R. 25 W.

#### **Berda and similar soils**

*Extent of the component in the map unit:* 23 percent

*Geomorphic setting:* Hillslopes on hills on uplands

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 5 to 12 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 10.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

A—0 to 9 inches; loam

Bw—9 to 27 inches; loam

Bk—27 to 47 inches; loam

C—47 to 80 inches; sandy loam

*Location of representative profile:* About 1,975 feet north and 2,000 feet west of the southeast corner of sec. 29, T. 28 N., R. 25 W.

### ***Minor Components***

- Quinlan and similar soils: 4 percent
- Guadalupe and similar soils: 3 percent

### ***Management***

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **OMBG—Oklark-Mansic-Berda complex, 12 to 45 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Oklark and similar soils**

*Extent of the component in the map unit:* 33 percent

*Geomorphic setting:* Hillslopes on hills on uplands

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 12 to 30 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 9.1 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—7e

Ecological site number and name—077EY049OK, Limy Sandy Plains

*Representative profile:*

A—0 to 10 inches; sandy loam

Bk—10 to 21 inches; sandy loam

C—21 to 80 inches; fine sandy loam

*Location of representative profile:* About 3,150 feet north and 425 feet east of the southwest corner of sec. 36, T. 28 N., R. 25 W.

#### **Mansic and similar soils**

*Extent of the component in the map unit:* 26 percent

*Geomorphic setting:* Hillslopes on hills on uplands

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 12 to 30 percent

*Runoff:* High

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 9.7 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—7e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

A—0 to 12 inches; loam

Bk1—12 to 21 inches; sandy clay loam

Bk2—21 to 39 inches; sandy clay loam

C—39 to 80 inches; sandy loam

*Location of representative profile:* About 3,150 feet north and 225 feet east of the southwest corner of sec. 36, T. 28 N., R. 25 W.

#### **Berda and similar soils**

*Extent of the component in the map unit:* 25 percent

*Geomorphic setting:* Hillslopes on hills on uplands

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 12 to 45 percent

*Runoff:* High

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 8.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—7e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

A—0 to 7 inches; loam

Bk—7 to 22 inches; clay loam

BCK—22 to 47 inches; clay loam

C—47 to 80 inches; clay loam

*Location of representative profile:* About 3,150 feet north and 1,025 feet east of the southwest corner of sec. 36, T. 28 N., R. 25 W.

### ***Minor Components***

- Guadalupe and similar soils: 8 percent
- Laverne and similar soils: 8 percent

### ***Management***

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **PdoA—Paloduro clay loam, 0 to 1 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Paloduro and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Hillslopes on hills on uplands

*Position on landform:* Shoulders

*Parent material:* Colluvium from alluvium

*Slope:* 0 to 1 percent

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 8.9 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—2e

Land capability classification, irrigated—2e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

Ap—0 to 9 inches; clay loam

Bk1—9 to 14 inches; clay loam

Bk2—14 to 27 inches; clay loam

BC—27 to 80 inches; stratified clay loam

*Location of representative profile:* About 1,000 feet north and 2,500 feet east of the southwest corner of sec. 34, T. 28 N., R. 25 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **PdoB—Paloduro clay loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Paloduro and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Hillslopes on hills on uplands

*Position on landform:* Shoulders

*Parent material:* Colluvium from alluvium

*Slope:* 1 to 3 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 8.9 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—2e

Land capability classification, irrigated—2e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

Ap—0 to 10 inches; clay loam

Bk1—10 to 20 inches; loam

Bk2—20 to 35 inches; loam

Ab—35 to 44 inches; loam

Bkb—44 to 80 inches; loam

*Location of representative profile:* About 175 feet south and 2,200 feet east of the northwest corner of sec. 33, T. 28 N., R. 25 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **PdoC2—Paloduro clay loam, 3 to 5 percent slopes, eroded**

### ***Map Unit Setting***

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Paloduro and similar soils**

*Extent of the component in the map unit:* 90 percent

*Geomorphic setting:* Hillslopes on hills on uplands

*Position on landform:* Backslopes

*Parent material:* Colluvium from alluvium

*Slope:* 3 to 5 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 9.0 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—077EY848OK, Reseeded Limy Upland

*Representative profile:*

A—0 to 10 inches; clay loam

Bk1—10 to 25 inches; loam

Bk2—25 to 49 inches; loam

Bk3—49 to 80 inches; fine sandy loam

*Location of representative profile:* About 2,175 feet north and 225 feet west of the southeast corner of sec. 23, T. 27 N., R. 24 W.

**Minor Components**

- Mobeetie and similar soils: 10 percent

**Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**PIT—Pits****Map Unit Setting**

*Major land resource area:* 77E

*General location:* Throughout the county

*Elevation:* 1,600 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

**Major Component Description****Pits**

*Extent of the component in the map unit:* 100 percent

*Slope:* 0 to 12 percent

*Interpretive groups:*

Land capability classification, nonirrigated—8

*Location of representative area:* About 1,300 feet north and 2,500 feet east of the southwest corner of sec. 3, T. 25 N., R. 25 W.

Additional information specific to this map unit is included in the section “Soil Properties.”

**Management**

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**PlmB—Plemons loam, 1 to 3 percent slopes****Map Unit Setting**

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet



*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F  
*Frost-free period:* 185 to 200 days  
*Shape of individual mapped areas:* Irregular  
*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Plemons and similar soils**

*Extent of the component in the map unit:* 100 percent  
*Geomorphic setting:* Terraces on uplands  
*Position on landform:* Treads  
*Parent material:* Alluvium  
*Slope:* 1 to 3 percent  
*Runoff:* Low  
*Soil depth:* More than 60 inches  
*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
     Moderate  
*Slowest permeability class within a depth of 80 inches:* Moderate  
*Drainage class:* Well drained  
*Available water capacity:* About 8.7 inches  
*Depth to a seasonal high water table:* More than 6 feet  
*Flooding:* None  
*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—3e  
 Land capability classification, irrigated—3e  
 Ecological site number and name—077EY048OK, Limy Upland

#### *Representative profile:*

A—0 to 8 inches; loam  
 Btk1—8 to 21 inches; clay loam  
 Btk2—21 to 46 inches; clay loam  
 Btk3—46 to 80 inches; clay loam

*Location of representative profile:* About 2,350 feet south and 1,200 feet west of the northeast corner of sec. 12, T. 27 N., R. 25 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections "Use and Management of the Soils" and "Soil Properties."

## **P1mC—Plemons loam, 3 to 5 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 77E  
*General location:* Western part of the county  
*Elevation:* 2,100 to 2,450 feet  
*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F  
*Frost-free period:* 185 to 200 days  
*Shape of individual mapped areas:* Irregular  
*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Plemons and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Terraces on uplands

*Position on landform:* Risers

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 8.4 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

A—0 to 8 inches; loam

Bw—8 to 18 inches; sandy clay loam

Btk—18 to 42 inches; clay loam

Btkb1—42 to 60 inches; clay loam

Btkb2—60 to 80 inches; clay loam

*Location of representative profile:* About 1,650 feet north and 1,750 feet east of the southwest corner of sec. 15, T. 25 N., R. 26 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections "Use and Management of the Soils" and "Soil Properties."

## **P1mD—Plemons loam, 5 to 8 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Plemons and similar soils**

*Extent of the component in the map unit:* 90 percent

*Geomorphic setting:* Terraces on uplands

*Position on landform:* Risers

*Parent material:* Alluvium

*Slope:* 5 to 8 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 8.5 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4e

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

A—0 to 8 inches; loam

Bw—8 to 19 inches; sandy clay loam

Btk1—19 to 37 inches; clay loam

Btk2—37 to 60 inches; clay loam

Btk3—60 to 80 inches; clay loam

*Location of representative profile:* About 300 feet south and 1,450 feet west of the northeast corner of sec. 1, T. 27 N., R. 25 W.

### ***Minor Components***

- Hardeman and similar soils: 5 percent
- Laverne and similar soils: 5 percent

### ***Management***

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **QnWC3—Quinlan-Woodward complex, 3 to 5 percent slopes, severely eroded**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Quinlan and similar soils**

*Extent of the component in the map unit:* 67 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Backslopes

*Parent material:* Residuum weathered from sandstone

*Slope:* 3 to 5 percent

*Runoff:* Medium

*Soil depth:* 10 to 20 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 1.9 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—078XY883OK, Reseeded Shallow Prairie

*Representative profile:*

Bw—0 to 13 inches; loam

Cr—13 to 18 inches; weathered bedrock

*Location of representative profile:* About 3,300 feet north and 250 feet west of the southeast corner of sec. 9, T. 28 N., R. 21 W.

#### **Woodward and similar soils**

*Extent of the component in the map unit:* 33 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Backslopes

*Parent material:* Residuum weathered from sandstone

*Slope:* 3 to 5 percent

*Runoff:* Low

*Soil depth:* 20 to 40 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 5.7 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—078XY856OK, Reseeded Loamy Prairie

*Representative profile:*

Ap—0 to 3 inches; loam

Bw—3 to 30 inches; loam

Cr—30 to 35 inches; weathered bedrock

*Location of representative profile:* About 3,250 feet north and 300 feet west of the southeast corner of sec. 9, T. 28 N., R. 21 W.

#### **Management**

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections "Use and Management of the Soils" and "Soil Properties."

## **QnWD—Quinlan-Woodward complex, 5 to 8 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Quinlan and similar soils**

*Extent of the component in the map unit:* 48 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Backslopes

*Parent material:* Residuum weathered from sandstone

*Slope:* 5 to 8 percent

*Runoff:* High

*Soil depth:* 10 to 20 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 2.5 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4e

Ecological site number and name—078XY083OK, Shallow Prairie (north)

*Representative profile:*

A—0 to 6 inches; loam

Bw—6 to 15 inches; loam

Cr—15 to 24 inches; weathered bedrock

*Location of representative profile:* About 650 feet south and 800 feet west of the northeast corner of sec. 13, T. 28 N., R. 23 W. (fig. 11)

#### **Woodward and similar soils**

*Extent of the component in the map unit:* 30 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Backslopes

*Parent material:* Residuum weathered from sandstone

*Slope:* 5 to 8 percent

*Runoff:* Medium

*Soil depth:* 20 to 40 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 4.9 inches



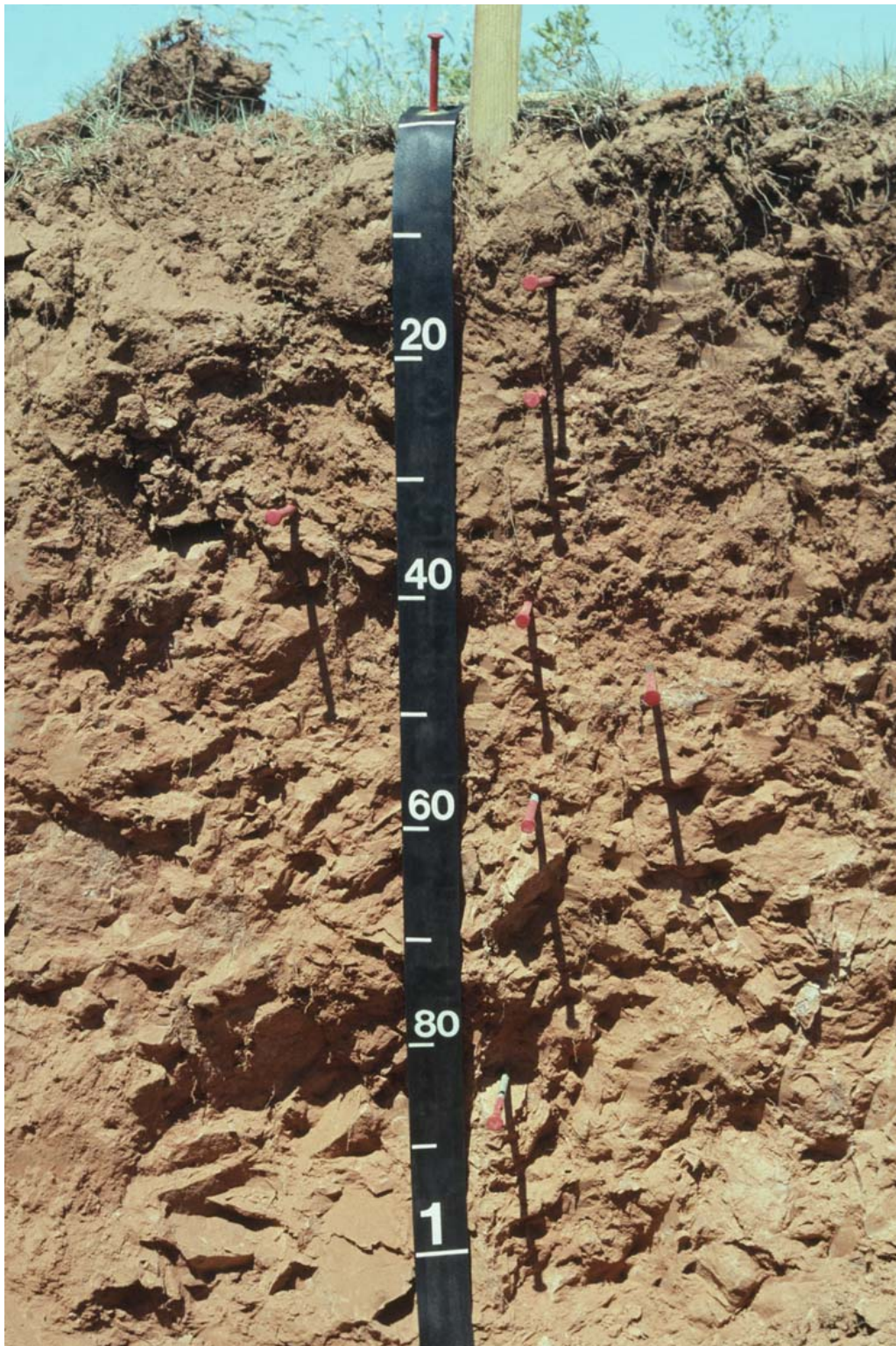


Figure 11.—Profile of a soil in the Quinlan series.

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4e

Ecological site number and name—078XY057OK, Loamy Prairie (cal)

*Representative profile:*

A—0 to 8 inches; silt loam

Bw1—8 to 18 inches; loam

Bw2—18 to 25 inches; loam

Cr—25 to 29 inches; weathered bedrock

*Location of representative profile:* About 400 feet south and 950 feet west of the northeast corner of sec. 13, T. 28 N., R. 23 W.

**Minor Components**

- Selman and similar soils: 10 percent
- Deepwood and similar soils: 6 percent
- St. Paul and similar soils: 3 percent
- Vernon and similar soils: 3 percent

**Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **QnWE—Quinlan-Woodward complex, 5 to 12 percent slopes**

**Map Unit Setting**

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

**Major Component Description****Quinlan and similar soils**

*Extent of the component in the map unit:* 72 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Backslopes

*Parent material:* Residuum weathered from sandstone

*Slope:* 5 to 12 percent

*Runoff:* High

*Soil depth:* 10 to 20 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 3.0 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None



*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—078XY083OK, Shallow Prairie (north)

*Representative profile:*

A—0 to 6 inches; loam

Bk—6 to 14 inches; loam

BC—14 to 18 inches; loam

Cr—18 to 22 inches; weathered bedrock

*Location of representative profile:* About 1,625 feet north and 2,400 feet east of the southwest corner of sec. 12, T. 25 N., R. 23 W.**Woodward and similar soils***Extent of the component in the map unit:* 24 percent*Geomorphic setting:* Hills on uplands*Position on landform:* Backslopes*Parent material:* Residuum weathered from sandstone*Slope:* 5 to 12 percent*Runoff:* Medium*Soil depth:* 20 to 40 inches to paralithic bedrock*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate*Slowest permeability class within a depth of 80 inches:* Moderately slow*Drainage class:* Well drained*Available water capacity:* About 4.2 inches*Depth to a seasonal high water table:* More than 6 feet*Flooding:* None*Ponding:* None*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—078XY057OK, Loamy Prairie (cal)

*Representative profile:*

A—0 to 4 inches; very fine sandy loam

Bw—4 to 16 inches; loam

BCk—16 to 22 inches; loam

Cr—22 to 26 inches; weathered bedrock

*Location of representative profile:* About 2,625 feet north and 2,400 feet east of the southwest corner of sec. 12, T. 25 N., R. 23 W.**Minor Components**

- Grandmore and similar soils: 4 percent

**Management***Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**QRWG—Quinlan-Rock outcrop-Woodward complex, 5 to 45 percent slopes****Map Unit Setting***Major land resource area:* 78C*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet  
*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F  
*Frost-free period:* 185 to 200 days  
*Shape of individual mapped areas:* Irregular  
*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Quinlan and similar soils**

*Extent of the component in the map unit:* 50 percent  
*Geomorphic setting:* Hills on uplands  
*Position on landform:* Backslopes  
*Parent material:* Residuum weathered from sandstone  
*Slope:* 5 to 45 percent  
*Runoff:* Very high  
*Soil depth:* 10 to 20 inches to paralithic bedrock  
*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate  
*Slowest permeability class within a depth of 80 inches:* Moderately slow  
*Drainage class:* Well drained  
*Available water capacity:* About 2.3 inches  
*Depth to a seasonal high water table:* More than 6 feet  
*Flooding:* None  
*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—7e  
Ecological site number and name—078XY005OK, Loamy Breaks

#### *Representative profile:*

A—0 to 8 inches; loam  
Bw—8 to 13 inches; loam  
Cr—13 to 18 inches; weathered bedrock

*Location of representative profile:* About 400 feet north and 1,500 feet east of the southwest corner of sec. 1, T. 26 N., R. 24 W.

#### **Rock outcrop**

*Extent of the component in the map unit:* 33 percent  
*Geomorphic setting:* Hills on uplands  
*Position on landform:* Shoulders  
*Parent material:* Weathered sandstone  
*Slope:* 5 to 45 percent  
*Runoff:* Very high  
*Soil depth:* 0 to 3 inches to lithic bedrock

#### *Interpretive groups:*

Land capability classification, nonirrigated—8

*Location of representative area:* About 300 feet north and 1,500 feet east of the southwest corner of sec. 1, T. 26 N., R. 24 W.

#### **Woodward and similar soils**

*Extent of the component in the map unit:* 17 percent  
*Geomorphic setting:* Hills on uplands  
*Position on landform:* Backslopes  
*Parent material:* Residuum weathered from sandstone  
*Slope:* 5 to 20 percent

*Runoff:* Medium

*Soil depth:* 20 to 40 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 4.2 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—078XY057OK, Loamy Prairie (cal)

*Representative profile:*

A—0 to 6 inches; loam

Bw—6 to 14 inches; loam

BC—14 to 22 inches; loam

Cr—22 to 25 inches; weathered bedrock

*Location of representative profile:* About 800 feet north and 1,500 feet east of the southwest corner of sec. 1, T. 26 N., R. 24 W.

### ***Management***

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **QRYG—Quinlan-Rock outcrop-Yomont complex, 0 to 45 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 50 to 1,000 acres

### ***Major Component Description***

#### **Quinlan and similar soils**

*Extent of the component in the map unit:* 41 percent

*Geomorphic setting:* Drainageways on uplands

*Position on landform:* Backslopes

*Parent material:* Residuum weathered from sandstone

*Slope:* 5 to 45 percent

*Runoff:* Very high

*Soil depth:* 10 to 20 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 2.5 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—7e

Ecological site number and name—078XY005OK, Loamy Breaks

*Representative profile:*

A—0 to 8 inches; loam

Bw—8 to 14 inches; loam

Cr—14 to 18 inches; weathered bedrock

*Location of representative profile:* About 50 feet north and 800 feet east of the southwest corner of sec. 30, T. 26 N., R. 22 W.

### **Rock outcrop**

*Extent of the component in the map unit:* 18 percent

*Geomorphic setting:* Drainageways on uplands

*Position on landform:* Backslopes

*Parent material:* Weathered sandstone

*Slope:* 12 to 45 percent

*Runoff:* Very high

*Soil depth:* 0 to 3 inches to lithic bedrock

*Interpretive groups:*

Land capability classification, nonirrigated—8

*Location of representative area:* About 150 feet north and 800 feet east of the southwest corner of sec. 30, T. 26 N., R. 22 W.

### **Yomont and similar soils**

*Extent of the component in the map unit:* 17 percent

*Geomorphic setting:* Flood plains in drainageways on uplands

*Parent material:* Alluvium

*Slope:* 0 to 2 percent

*Runoff:* Very low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 10.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* Frequent

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—5w

Ecological site number and name—078XY050OK, Loamy Bottomland

*Representative profile:*

A—0 to 11 inches; loam

C1—11 to 22 inches; loam

C2—22 to 38 inches; very fine sandy loam

C3—38 to 52 inches; very fine sandy loam

C4—52 to 80 inches; stratified very fine sandy loam

*Location of representative profile:* About 650 feet north and 800 feet east of the southwest corner of sec. 30, T. 26 N., R. 22 W.

#### ***Minor Components***

- Deepwood and similar soils: 14 percent
- Woodward and similar soils: 10 percent

#### ***Management***

*Major uses:* Rangeland (fig. 12)

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

### **QWDE—Quinlan-Woodward-Deepwood complex, 5 to 12 percent slopes**

#### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 400 acres



**Figure 12.—**Typical landscape in an area of Quinlan-Rock outcrop-Yomont complex, 0 to 45 percent slopes. Quinlan soils are on the interfluvies. Rock outcrop is on steep side slopes and at the head of drains. Yomont soils are in the drainageways in the foreground.

### ***Major Component Description***

#### **Quinlan and similar soils**

*Extent of the component in the map unit:* 41 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Shoulders

*Parent material:* Residuum weathered from sandstone

*Slope:* 5 to 12 percent

*Runoff:* High

*Soil depth:* 10 to 20 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 2.5 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—078XY083OK, Shallow Prairie (north)

*Representative profile:*

A—0 to 6 inches; very fine sandy loam

Bk1—6 to 9 inches; loam

Bk2—9 to 16 inches; gravelly loam

Cr—16 to 43 inches; weathered bedrock

*Location of representative profile:* About 1,700 feet south and 1,700 feet east of the northwest corner of sec. 32, T. 26 N., R. 21 W.

#### **Woodward and similar soils**

*Extent of the component in the map unit:* 38 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Backslopes

*Parent material:* Residuum weathered from sandstone

*Slope:* 5 to 12 percent

*Runoff:* Medium

*Soil depth:* 20 to 40 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 4.6 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—078XY057OK, Loamy Prairie (cal)

*Representative profile:*

A—0 to 10 inches; silt loam

Bk1—10 to 17 inches; silt loam

Bk2—17 to 25 inches; silt loam

Cr—25 to 27 inches; weathered bedrock

*Location of representative profile:* About 2,250 feet south and 2,100 feet east of the northwest corner of sec. 32, T. 26 N., R. 21 W.

**Deepwood and similar soils**

*Extent of the component in the map unit:* 12 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Footslopes

*Parent material:* Colluvium from sandstone

*Slope:* 5 to 12 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 11.0 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—078XY057OK, Loamy Prairie (cal)

*Representative profile:*

A—0 to 12 inches; very fine sandy loam

Bk1—12 to 28 inches; very fine sandy loam

Bk2—28 to 80 inches; very fine sandy loam

Bc—80 to 92 inches; very fine sandy loam

C—92 to 106 inches; very fine sandy loam

*Location of representative profile:* About 2,300 feet south and 2,000 feet east of the northwest corner of sec. 32, T. 26 N., R. 21 W.

**Minor Components**

- Obaro and similar soils: 3 percent
- St. Paul and similar soils: 3 percent
- Selman and similar soils: 2 percent
- Vernon and similar soils: 1 percent

**Management**

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**QWRC—Quinlan-Woodward-Rock outcrop complex, 1 to 5 percent slopes**

**Map Unit Setting**

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days



*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Quinlan and similar soils**

*Extent of the component in the map unit:* 58 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Summits

*Parent material:* Residuum weathered from sandstone

*Slope:* 1 to 5 percent

*Runoff:* Medium

*Soil depth:* 10 to 20 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 2.2 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4s

Ecological site number and name—078XY083OK, Shallow Prairie (north)

*Representative profile:*

A—0 to 6 inches; very fine sandy loam

Bw—6 to 14 inches; very fine sandy loam

Cr—14 to 18 inches; weathered bedrock

*Location of representative profile:* About 100 feet north and 1,700 feet west of the southeast corner of sec. 8, T. 27 N., R. 22 W.

#### **Woodward and similar soils**

*Extent of the component in the map unit:* 23 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Summits

*Parent material:* Residuum weathered from sandstone

*Slope:* 1 to 5 percent

*Runoff:* Low

*Soil depth:* 20 to 40 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 7.1 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Ecological site number and name—078XY057OK, Loamy Prairie (cal)

*Representative profile:*

A—0 to 6 inches; very fine sandy loam

Bw1—6 to 18 inches; very fine sandy loam

Bw2—18 to 28 inches; very fine sandy loam

BC—28 to 38 inches; very fine sandy loam

Cr—38 to 42 inches; weathered bedrock

*Location of representative profile:* About 150 feet north and 1,800 feet west of the southeast corner of sec. 8, T. 27 N., R. 22 W.

**Rock outcrop**

*Extent of the component in the map unit:* 10 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Shoulders

*Parent material:* Weathered sandstone

*Slope:* 1 to 5 percent

*Runoff:* High

*Soil depth:* 0 to 3 inches to lithic bedrock

*Interpretive groups:*

Land capability classification, nonirrigated—8

*Location of representative area:* About 100 feet north and 1,700 feet west of the southeast corner of sec. 8, T. 27 N., R. 22 W.

**Minor Components**

- Ruella and similar soils: 6 percent
- Vernon and similar soils: 3 percent

**Management**

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**RoCH—Rock outcrop-Cottonwood complex, 12 to 80 percent slopes**

**Map Unit Setting**

*Major land resource area:* 78C

*General location:* Eastern part of the county

*Elevation:* 1,600 to 1,800 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

**Major Component Description**

**Rock outcrop**

*Extent of the component in the map unit:* 55 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Backslopes

*Parent material:* Gypsum

*Slope:* 12 to 80 percent

*Runoff:* Very high

*Soil depth:* 0 to 3 inches to lithic bedrock

*Interpretive groups:*

Land capability classification, nonirrigated—8

*Location of representative area:* About 1,700 feet north and 600 feet west of the southeast corner of sec. 36, T. 27 N., R. 21 W.

**Cottonwood and similar soils**

*Extent of the component in the map unit:* 30 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Backslopes

*Parent material:* Residuum weathered from gypsum

*Slope:* 12 to 20 percent

*Runoff:* High

*Soil depth:* 3 to 12 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 1.4 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—7s

Ecological site number and name—078XY038OK, Gyp

*Representative profile:*

A—0 to 9 inches; loam

Cr—9 to 13 inches; weathered bedrock

*Location of representative profile:* About 1,700 feet north and 600 feet west of the southeast corner of sec. 36, T. 27 N., R. 21 W.

**Minor Components**

- Aspermont and similar soils: 5 percent
- Vernon and similar soils: 5 percent
- Vinson and similar soils: 5 percent

**Management**

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**RssA—Rosston clay, ponded, 0 to 1 percent slopes**

**Map Unit Setting**

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 3 to 150 acres

### ***Major Component Description***

#### **Rosston and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Playa floors on playas on plains

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Very slow

*Slowest permeability class within a depth of 80 inches:* Very slow

*Drainage class:* Poorly drained

*Available water capacity:* About 8.3 inches

*Depth to a seasonal high water table:* At the surface

*Flooding:* None

*Ponding:* Frequent

*Interpretive groups:*

Land capability classification, nonirrigated—5w

Ecological site number and name—077EY098OK, Depressional Upland

*Representative profile:*

A—0 to 13 inches; clay

Bss1—13 to 31 inches; clay

Bss2—31 to 51 inches; clay

C—51 to 80 inches; clay

*Location of representative profile:* About 800 feet north and 400 feet west of the southeast corner of sec. 22, T. 28 N., R. 26 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections "Use and Management of the Soils" and "Soil Properties."

## **SAL—Salt flats, 0 to 1 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Along the Cimarron river in the northeastern part of the county

*Elevation:* 1,600 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Salt flats**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Flood plains in river valleys

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* Very high

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Somewhat poorly drained

*Available water capacity:* About 2.2 inches

*Depth to a seasonal high water table:* At the surface

*Flooding:* Frequent

*Ponding:* Occasional

*Other properties:* Saline within a depth of 30 inches; sodic within a depth of 30 inches

*Interpretive groups:*

Land capability classification, nonirrigated—8

*Location of representative area:* About 3,400 feet north and 400 feet west of the southeast corner of sec. 36, T. 27 N., R. 20 W.

### ***Management***

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **SelA—Selman silt loam, 0 to 1 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Selman and similar soils**

*Extent of the component in the map unit:* 96 percent

*Geomorphic setting:* Terraces in river valleys

*Position on landform:* Treads

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 11.7 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—1

Land capability classification, irrigated—1

Ecological site number and name—078XY056OK, Loamy Prairie

*Representative profile:*

A—0 to 15 inches; silt loam

BA—15 to 25 inches; silt loam

Btk1—25 to 38 inches; silt loam

Btk2—38 to 55 inches; silt loam

C—55 to 80 inches; loam

*Location of representative profile:* About 1,800 feet south and 2,600 feet east of the northwest corner of sec. 32, T. 28 N., R. 21 W.

**Minor Components**

- Frankirk and similar soils: 4 percent

**Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**SelB—Selman silt loam, 1 to 3 percent slopes**

**Map Unit Setting**

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

**Major Component Description**

**Selman and similar soils**

*Extent of the component in the map unit:* 92 percent

*Geomorphic setting:* Terraces in river valleys

*Position on landform:* Treads

*Parent material:* Alluvium

*Slope:* 1 to 3 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 11.7 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—2e

Land capability classification, irrigated—2e

Ecological site number and name—078XY056OK, Loamy Prairie

*Representative profile:*

Ap—0 to 5 inches; silt loam

BA—5 to 16 inches; loam

Btk—16 to 51 inches; loam

BCk—51 to 61 inches; silt loam

C—61 to 80 inches; loam

*Location of representative profile:* About 650 feet north and 2,650 feet west of the southeast corner of sec. 14, T. 27 N., R. 22 W.

**Minor Components**

- Hollister and similar soils: 4 percent
- Woodward and similar soils: 4 percent

**Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**SelC—Selman silt loam, 3 to 5 percent slopes****Map Unit Setting**

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

**Major Component Description****Selman and similar soils**

*Extent of the component in the map unit:* 87 percent

*Geomorphic setting:* Terraces in river valleys

*Position on landform:* Risers

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 11.7 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—078XY056OK, Loamy Prairie



*Representative profile:*

A—0 to 8 inches; silt loam

BA—8 to 14 inches; silt loam

Bt—14 to 27 inches; silt loam

Btk—27 to 56 inches; silty clay loam

C—56 to 80 inches; silt loam

*Location of representative profile:* About 2,300 feet north and 1,900 feet east of the southwest corner of sec. 1, T. 26 N., R. 22 W.

***Minor Components***

- Woodward and similar soils: 10 percent
- Obaro and similar soils: 3 percent

***Management***

*Major uses:* Rangeland and cropland (fig. 13)

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**SelC2—Selman silt loam, 3 to 5 percent slopes, eroded*****Map Unit Setting***

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres



Figure 13.—No-till wheat in an area of Selman silt loam, 3 to 5 percent slopes.

### ***Major Component Description***

#### **Selman and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Terraces in river valleys

*Position on landform:* Risers

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 11.7 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—078XY856OK, Reseeded Loamy Prairie

*Representative profile:*

Ap—0 to 6 inches; silt loam

Bk—6 to 18 inches; silt loam

Btk1—18 to 31 inches; silty clay loam

Btk2—31 to 54 inches; silty clay loam

BC—54 to 80 inches; loam

*Location of representative profile:* About 1,400 feet north and 1,500 feet west of the southeast corner of sec. 32, T. 29 N., R. 25 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections "Use and Management of the Soils" and "Soil Properties."

## **SelD—Selman silt loam, 5 to 8 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Selman and similar soils**

*Extent of the component in the map unit:* 94 percent

*Geomorphic setting:* Terraces in river valleys

*Position on landform:* Risers

*Parent material:* Alluvium

*Slope:* 5 to 8 percent

*Runoff:* High

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 11.7 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4e

Land capability classification, irrigated—4e

Ecological site number and name—078XY056OK, Loamy Prairie

*Representative profile:*

A—0 to 9 inches; silt loam

BA—9 to 16 inches; silt loam

Btk—16 to 61 inches; silty clay loam

Bk—61 to 80 inches; silt loam

*Location of representative profile:* About 100 feet north and 2,600 feet west of the southeast corner of sec. 29, T. 26 N., R. 22 W.

### ***Minor Components***

- Deepwood and similar soils: 6 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **SelD2—Selman silt loam, 5 to 8 percent slopes, eroded**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Selman and similar soils**

*Extent of the component in the map unit:* 81 percent

*Geomorphic setting:* Terraces in river valleys

*Position on landform:* Risers

*Parent material:* Alluvium

*Slope:* 5 to 8 percent

*Runoff:* High

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 11.8 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4e

Land capability classification, irrigated—4e

Ecological site number and name—078XY856OK, Reseeded Loamy Prairie

*Representative profile:*

Ap—0 to 7 inches; silt loam

Bt—7 to 24 inches; silty clay loam

Btk—24 to 43 inches; silty clay loam

Bk—43 to 80 inches; silt loam

*Location of representative profile:* About 400 feet north and 3,850 feet west of the southeast corner of sec. 6, T. 28 N., R. 25 W.

### ***Minor Components***

- Deepwood and similar soils: 15 percent
- Quinlan and similar soils: 4 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **SprA—Spur loam, 0 to 1 percent slopes, rarely flooded**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Along major rivers and streams

*Elevation:* 1,600 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Spur and similar soils**

*Extent of the component in the map unit:* 87 percent

*Geomorphic setting:* Flood plains in river valleys

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 10.0 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* Rare

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—2e

Land capability classification, irrigated—2e

Ecological site number and name—078XY050OK, Loamy Bottomland

*Representative profile:*

Ap—0 to 12 inches; loam

Bw—12 to 21 inches; sandy clay loam

Bk1—21 to 39 inches; sandy clay loam

Bk2—39 to 80 inches; sandy clay loam

*Location of representative profile:* About 1,950 feet south and 200 feet east of the northwest corner of sec. 17, T. 26 N., R. 25 W.

### ***Minor Components***

- Yomont and similar soils: 10 percent
- Guadalupe and similar soils: 3 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **SpsA—Spur loam, saline, 0 to 1 percent slopes, rarely flooded**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Along major rivers and streams

*Elevation:* 1,600 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Spur and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Flood plains in river valleys

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 10.0 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* Rare

*Ponding:* None

*Other properties:* Saline within a depth of 30 inches

*Interpretive groups:*

Land capability classification, nonirrigated—3s

Ecological site number and name—078CY047OK, Loamy Saline Bottomland

*Representative profile:*

A—0 to 18 inches; loam

Bkz1—18 to 35 inches; clay loam

Bkz2—35 to 57 inches; clay loam

C—57 to 80 inches; clay loam

*Location of representative profile:* About 1,300 feet north and 2,900 feet west of the southeast corner of sec. 19, T. 29 N., R. 24 W.

### ***Management***

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **StpA—St. Paul silt loam, 0 to 1 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **St. Paul and similar soils**

*Extent of the component in the map unit:* 92 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Summits

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 11.4 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—1

Land capability classification, irrigated—1

Ecological site number and name—078XY056OK, Loamy Prairie

*Representative profile:*

Ap—0 to 13 inches; silt loam

Bt—13 to 22 inches; silt loam

Btk—22 to 66 inches; silty clay loam

Atb—66 to 77 inches; loam

Cb—77 to 88 inches; loam

*Location of representative profile:* About 1,600 feet south and 900 feet west of the northeast corner of sec. 32, T. 29 N., R. 22 W. (fig. 14)

### **Minor Components**

- Hollister and similar soils: 8 percent

### **Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **StpB—St. Paul silt loam, 1 to 3 percent slopes**

### **Map Unit Setting**

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### **Major Component Description**

#### **St. Paul and similar soils**

*Extent of the component in the map unit:* 93 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Summits

*Parent material:* Alluvium

*Slope:* 1 to 3 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 11.4 inches

*Depth to a seasonal high water table:* More than 6 feet





Figure 14.—Profile of a soil in the St. Paul series.

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—2e

Land capability classification, irrigated—2e

Ecological site number and name—078XY056OK, Loamy Prairie

*Representative profile:*

Ap—0 to 13 inches; silt loam

Bt—13 to 20 inches; silty clay loam

Btk1—20 to 31 inches; silty clay loam

Btk2—31 to 45 inches; silty clay loam

Bk—45 to 86 inches; silt loam

*Location of representative profile:* About 400 feet south and 2,400 feet east of the northwest corner of sec. 28, T. 29 N., R. 23 W.

### **Minor Components**

- Hollister and similar soils: 6 percent
- Tillman and similar soils: 1 percent

### **Management**

*Major uses:* Rangeland and cropland (fig. 15)

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **StpC—St. Paul silt loam, 3 to 5 percent slopes**

### **Map Unit Setting**

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet



Figure 15.—Wheat in an area of St. Paul silt loam, 1 to 3 percent slopes.

*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F  
*Frost-free period:* 185 to 200 days  
*Shape of individual mapped areas:* Irregular  
*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **St. Paul and similar soils**

*Extent of the component in the map unit:* 95 percent  
*Geomorphic setting:* Paleoterraces on uplands  
*Position on landform:* Shoulders  
*Parent material:* Alluvium  
*Slope:* 3 to 5 percent  
*Runoff:* Low  
*Soil depth:* More than 60 inches  
*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
     Moderately slow  
*Slowest permeability class within a depth of 80 inches:* Moderately slow  
*Drainage class:* Well drained  
*Available water capacity:* About 11.3 inches  
*Depth to a seasonal high water table:* More than 6 feet  
*Flooding:* None  
*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—3e  
 Land capability classification, irrigated—3e  
 Ecological site number and name—078XY056OK, Loamy Prairie

#### *Representative profile:*

A—0 to 11 inches; silt loam  
 BA—11 to 20 inches; silt loam  
 Btk1—20 to 33 inches; silty clay loam  
 Btk2—33 to 51 inches; silty clay loam  
 C—51 to 80 inches; silt loam

*Location of representative profile:* About 4,900 feet south and 2,900 feet west of the northeast corner of sec. 15, T. 27 N., R. 20 W.

### ***Minor Components***

- Vernon and similar soils: 5 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **StpD—St. Paul silt loam, 5 to 8 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C  
*General location:* Throughout the county  
*Elevation:* 1,800 to 2,200 feet  
*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **St. Paul and similar soils**

*Extent of the component in the map unit:* 96 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Backslopes

*Parent material:* Alluvium

*Slope:* 5 to 8 percent

*Runoff:* High

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately slow

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 11.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4e

Land capability classification, irrigated—4e

Ecological site number and name—078XY056OK, Loamy Prairie

*Representative profile:*

A—0 to 9 inches; silt loam

Bt1—9 to 22 inches; silty clay loam

Bt2—22 to 42 inches; silty clay loam

Btk—42 to 61 inches; silty clay loam

Bk—61 to 80 inches; silt loam

*Location of representative profile:* About 3,100 feet south and 700 feet east of the northwest corner of sec. 30, T. 26 N., R. 22 W.

### ***Minor Components***

- Deepwood and similar soils: 4 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **TeWE—Teagard-Wellsford complex, 1 to 12 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Southeastern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Teagard and similar soils**

*Extent of the component in the map unit:* 53 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Summits

*Parent material:* Residuum weathered from clayey shale

*Slope:* 1 to 12 percent

*Runoff:* Very high

*Soil depth:* 20 to 40 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Very slow

*Slowest permeability class within a depth of 80 inches:* Very slow

*Drainage class:* Well drained

*Available water capacity:* About 5.5 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—078XY100OK, Shale

*Representative profile:*

A—0 to 9 inches; clay loam

Bkss1—9 to 18 inches; silty clay loam

Bkss2—18 to 30 inches; silty clay

BCKss—30 to 38 inches; silty clay loam

Cr—38 to 40 inches; weathered bedrock

*Location of representative profile:* About 700 feet south and 2,300 feet east of the northwest corner of sec. 22, T. 25 N., R. 22 W.

#### **Wellsford and similar soils**

*Extent of the component in the map unit:* 33 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Shoulders

*Parent material:* Residuum weathered from clayey shale

*Slope:* 1 to 12 percent

*Runoff:* Very high

*Soil depth:* 10 to 20 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Very slow

*Slowest permeability class within a depth of 80 inches:* Impermeable

*Drainage class:* Well drained

*Available water capacity:* About 1.8 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—078XY100OK, Shale



*Representative profile:*

A—0 to 7 inches; clay loam

Bk—7 to 16 inches; silty clay

Cr—16 to 20 inches; weathered bedrock

*Location of representative profile:* About 850 feet south and 2,300 feet east of the northwest corner of sec. 22, T. 25 N., R. 22 W.

**Minor Components**

- Berda and similar soils: 7 percent
- Mansic and similar soils: 7 percent

**Management**

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**TexA—Texroy loam, 0 to 1 percent slopes****Map Unit Setting**

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

**Major Component Description****Texroy and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Treads

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 10.6 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—1

Land capability classification, irrigated—1

Ecological site number and name—077EY048OK, Limy Upland

*Representative profile:*

Ap—0 to 13 inches; loam

BA—13 to 24 inches; loam

Btk1—24 to 37 inches; clay loam  
 Btk2—37 to 63 inches; clay loam  
 BCkg—63 to 80 inches; clay loam

*Location of representative profile:* About 2,500 feet north and 800 feet west of the southeast corner of sec. 15, T. 28 N., R. 26 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **TexB—Texroy loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 77E  
*General location:* Western part of the county  
*Elevation:* 2,100 to 2,450 feet  
*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F  
*Frost-free period:* 185 to 200 days  
*Shape of individual mapped areas:* Irregular  
*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Texroy and similar soils**

*Extent of the component in the map unit:* 100 percent  
*Geomorphic setting:* Paleoterraces on uplands  
*Position on landform:* Treads  
*Parent material:* Alluvium  
*Slope:* 1 to 3 percent  
*Runoff:* Low  
*Soil depth:* More than 60 inches  
*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
 Moderate  
*Slowest permeability class within a depth of 80 inches:* Moderately slow  
*Drainage class:* Well drained  
*Available water capacity:* About 10.6 inches  
*Depth to a seasonal high water table:* More than 6 feet  
*Flooding:* None  
*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—2e  
 Land capability classification, irrigated—2e  
 Ecological site number and name—077EY048OK, Limy Upland

#### *Representative profile:*

A—0 to 11 inches; loam  
 BA—11 to 23 inches; loam  
 Btk1—23 to 42 inches; clay loam  
 Btk2—42 to 64 inches; clay loam  
 BCk—64 to 80 inches; clay loam



*Location of representative profile:* About 2,200 feet south and 2,900 feet east of the northwest corner of sec. 13, T. 28 N., R. 26 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections "Use and Management of the Soils" and "Soil Properties."

## **TexC—Texroy loam, 3 to 5 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Texroy and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Paleoterraces on uplands

*Position on landform:* Risers

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 10.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—077EY048OK, Limy Upland

#### *Representative profile:*

A—0 to 12 inches; loam

BA—12 to 20 inches; loam

Bt—20 to 35 inches; clay loam

Btk—35 to 51 inches; clay loam

BCK—51 to 80 inches; clay loam

*Location of representative profile:* About 200 feet north and 400 feet west of the southeast corner of sec. 13, T. 28 N., R. 26 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **TipA—Tipton loam, 0 to 1 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Tipton and similar soils**

*Extent of the component in the map unit:* 95 percent

*Geomorphic setting:* Terraces in river valleys

*Position on landform:* Treads

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 10.6 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—1

Land capability classification, irrigated—1

Ecological site number and name—078XY056OK, Loamy Prairie

#### *Representative profile:*

Ap—0 to 10 inches; loam

Bt—10 to 21 inches; clay loam

Btk—21 to 45 inches; clay loam

Bk—45 to 62 inches; loam

BCK—62 to 80 inches; loam

*Location of representative profile:* About 50 feet south and 700 feet west of the northeast corner of sec. 20, T. 29 N., R. 23 W.

### ***Minor Components***

- Grandmore and similar soils: 5 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **TipB—Tipton loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Tipton and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Terraces in river valleys

*Position on landform:* Treads

*Parent material:* Alluvium

*Slope:* 1 to 3 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 10.6 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—2e

Land capability classification, irrigated—2e

Ecological site number and name—078XY056OK, Loamy Prairie

#### *Representative profile:*

A—0 to 8 inches; loam

BA—8 to 26 inches; loam

Btk1—26 to 38 inches; clay loam

Btk2—38 to 55 inches; clay loam

Btk3—55 to 80 inches; clay loam

*Location of representative profile:* About 150 feet south and 4,250 feet east of the northwest corner of sec. 15, T. 29 N., R. 22 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **TipC—Tipton loam, 3 to 5 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Tipton and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Terraces in river valleys

*Position on landform:* Risers

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 10.6 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—078XY056OK, Loamy Prairie

#### *Representative profile:*

A—0 to 23 inches; loam

Bt—23 to 35 inches; clay loam

Btk—35 to 49 inches; clay loam

BC—49 to 72 inches; clay loam

Ab—72 to 80 inches; loam

*Location of representative profile:* About 2,300 feet north and 650 feet west of the southeast corner of sec. 28, T. 29 N., R. 21 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**TipD—Tipton loam, 5 to 8 percent slopes*****Map Unit Setting***

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

***Major Component Description*****Tipton and similar soils**

*Extent of the component in the map unit:* 87 percent

*Geomorphic setting:* Terraces in river valleys

*Position on landform:* Risers

*Parent material:* Alluvium

*Slope:* 5 to 8 percent

*Runoff:* Medium

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 10.6 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4e

Land capability classification, irrigated—4e

Ecological site number and name—078XY056OK, Loamy Prairie

*Representative profile:*

A—0 to 17 inches; loam

BA—17 to 22 inches; loam

Btk—22 to 50 inches; loam

BC—50 to 70 inches; fine sandy loam

C—70 to 80 inches; fine sandy loam

*Location of representative profile:* About 2,650 feet north and 1,400 feet west of the southeast corner of sec. 17, T. 28 N., R. 25 W.

***Minor Components***

- Mcknight and similar soils: 9 percent
- Devol and similar soils: 4 percent

***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **TRQC—Talpa-Rock outcrop-Quinlan complex, 1 to 5 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Eastern part of the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Talpa and similar soils**

*Extent of the component in the map unit:* 53 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Summits

*Parent material:* Residuum weathered from dolostone

*Slope:* 1 to 5 percent

*Runoff:* High

*Soil depth:* 5 to 14 inches to lithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Slow

*Drainage class:* Well drained

*Available water capacity:* About 1.8 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4s

Ecological site number and name—078XY098OK, Very Shallow

*Representative profile:*

A—0 to 12 inches; loam

R—12 to 14 inches; bedrock

*Location of representative profile:* About 400 feet south and 2,200 feet west of the northeast corner of sec. 17, T. 25 N., R. 21 W.

#### **Rock outcrop**

*Extent of the component in the map unit:* 25 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Shoulders

*Parent material:* Dolostone

*Slope:* 1 to 5 percent

*Runoff:* Very high

*Soil depth:* 0 to 3 inches to lithic bedrock

*Interpretive groups:*

Land capability classification, nonirrigated—8

*Location of representative area:* About 400 feet south and 2,200 feet west of the northeast corner of sec. 17, T. 25 N., R. 21 W.



**Quinlan and similar soils**

*Extent of the component in the map unit:* 22 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Backslopes

*Parent material:* Residuum weathered from sandstone

*Slope:* 1 to 5 percent

*Runoff:* Medium

*Soil depth:* 10 to 20 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 2.5 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4s

Ecological site number and name—078XY083OK, Shallow Prairie (north)

*Representative profile:*

A—0 to 8 inches; loam

Bw—8 to 14 inches; loam

Cr—14 to 20 inches; weathered bedrock

*Location of representative profile:* About 400 feet south and 2,200 feet west of the northeast corner of sec. 17, T. 25 N., R. 21 W.

**Management**

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections "Use and Management of the Soils" and "Soil Properties."

**TvIC—Tivoli fine sand, 1 to 5 percent slopes****Map Unit Setting**

*Major land resource area:* 78C

*General location:* Along major rivers and streams

*Elevation:* 1,600 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 20 to 500 acres

**Major Component Description****Tivoli and similar soils**

*Extent of the component in the map unit:* 85 percent

*Geomorphic setting:* Dunes in dune fields in river valleys

*Parent material:* Eolian sands

*Slope:* 1 to 5 percent

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Rapid

*Slowest permeability class within a depth of 80 inches:* Rapid

*Drainage class:* Excessively drained

*Available water capacity:* About 3.2 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4e

Ecological site number and name—078XY014OK, Deep Sand

*Representative profile:*

A—0 to 7 inches; fine sand

C—7 to 80 inches; fine sand

*Location of representative profile:* About 3,200 feet south and 400 feet west of the northeast corner of sec. 34, T. 28 N., R. 23 W.

### **Minor Components**

- Devol and similar soils: 10 percent
- Grandfield and similar soils: 5 percent

### **Management**

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **TvIE—Tivoli fine sand, 5 to 12 percent slopes**

### **Map Unit Setting**

*Major land resource area:* 78C

*General location:* Along major rivers and streams

*Elevation:* 1,600 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 50 to 1,000 acres

### **Major Component Description**

#### **Tivoli and similar soils**

*Extent of the component in the map unit:* 88 percent

*Geomorphic setting:* Dunes in dune fields in river valleys

*Parent material:* Eolian sands

*Slope:* 5 to 12 percent

*Runoff:* Very low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Rapid

*Slowest permeability class within a depth of 80 inches:* Rapid

*Drainage class:* Excessively drained

*Available water capacity:* About 3.5 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—078XY022OK, Dune

*Representative profile:*

A—0 to 13 inches; fine sand

C1—13 to 20 inches; loamy sand

C2—20 to 80 inches; loamy sand

*Location of representative profile:* About 5,050 feet south and 200 feet west of the northeast corner of sec. 24, T. 25 N., R. 23 W.

### **Minor Components**

- Hardeman and similar soils: 6 percent
- Grandfield and similar soils: 4 percent
- Abbie and similar soils: 2 percent

### **Management**

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **TvIG—Tivoli fine sand, 12 to 45 percent slopes**

### **Map Unit Setting**

*Major land resource area:* 78C

*General location:* Along major rivers and streams

*Elevation:* 1,600 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 50 to 1,000 acres

### **Major Component Description**

#### **Tivoli and similar soils**

*Extent of the component in the map unit:* 97 percent

*Geomorphic setting:* Dunes in dune fields in river valleys

*Parent material:* Eolian sands

*Slope:* 12 to 45 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Rapid

*Slowest permeability class within a depth of 80 inches:* Rapid

*Drainage class:* Excessively drained

*Available water capacity:* About 3.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—7e

Ecological site number and name—078XY022OK, Dune

*Representative profile:*

A—0 to 8 inches; fine sand

C1—8 to 18 inches; loamy fine sand

C2—18 to 40 inches; loamy fine sand

C3—40 to 80 inches; loamy fine sand

*Location of representative profile:* About 5,100 feet south and 200 feet west of the northeast corner of sec. 19, T. 25 N., R. 22 W.

**Minor Components**

- Devol and similar soils: 3 percent

**Management**

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**VerB—Vernon clay loam, 1 to 3 percent slopes****Map Unit Setting**

*Major land resource area:* 78C

*General location:* Eastern part of the county

*Elevation:* 1,600 to 1,800 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

**Major Component Description****Vernon and similar soils**

*Extent of the component in the map unit:* 75 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Shoulders

*Parent material:* Residuum weathered from clayey shale

*Slope:* 1 to 3 percent

*Runoff:* Very high

*Soil depth:* 20 to 40 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Very slow

*Slowest permeability class within a depth of 80 inches:* Impermeable

*Drainage class:* Well drained

*Available water capacity:* About 4.5 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Other properties:* Saline within a depth of 30 inches

*Interpretive groups:*

Land capability classification, nonirrigated—3s

Ecological site number and name—078XY031OK, Clay Prairie (south)

*Representative profile:*

A—0 to 5 inches; clay loam  
Bk1—5 to 11 inches; clay loam  
Bk2—11 to 22 inches; clay  
Bk3—22 to 34 inches; clay  
Cr—34 to 39 inches; bedrock

*Location of representative profile:* About 2,850 feet north and 350 feet west of the southeast corner of sec. 20, T. 25 N., R. 21 W.

**Minor Components**

- Woodward and similar soils: 15 percent
- Deepwood and similar soils: 5 percent
- Mcknight and similar soils: 5 percent

**Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections "Use and Management of the Soils" and "Soil Properties."

**VerC—Vernon clay loam, 3 to 5 percent slopes****Map Unit Setting**

*Major land resource area:* 78C  
*General location:* Eastern part of the county  
*Elevation:* 1,600 to 1,800 feet  
*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F  
*Frost-free period:* 185 to 200 days  
*Shape of individual mapped areas:* Irregular  
*Size of areas:* 10 to 200 acres

**Major Component Description****Vernon and similar soils**

*Extent of the component in the map unit:* 69 percent  
*Geomorphic setting:* Hills on uplands  
*Position on landform:* Backslopes  
*Parent material:* Residuum weathered from clayey shale  
*Slope:* 3 to 5 percent  
*Runoff:* Very high  
*Soil depth:* 20 to 40 inches to paralithic bedrock  
*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Slow  
*Slowest permeability class within a depth of 80 inches:* Impermeable  
*Drainage class:* Well drained  
*Available water capacity:* About 4.7 inches  
*Depth to a seasonal high water table:* More than 6 feet  
*Flooding:* None  
*Ponding:* None  
*Other properties:* Saline within a depth of 30 inches

*Interpretive groups:*

Land capability classification, nonirrigated—4e  
Ecological site number and name—078XY031OK, Clay Prairie (south)

*Representative profile:*

A—0 to 6 inches; clay loam

Bk—6 to 35 inches; gravelly clay

Cr—35 to 39 inches; bedrock

*Location of representative profile:* About 1,600 feet north and 1,200 feet east of the southwest corner of sec. 25, T. 28 N., R. 21 W.

**Minor Components**

- Carey and similar soils: 10 percent
- Woodward and similar soils: 7 percent
- Ruella and similar soils: 6 percent
- Cornick and similar soils: 4 percent
- Cottonwood and similar soils: 4 percent

**Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**VerD—Vernon clay loam, 5 to 8 percent slopes****Map Unit Setting**

*Major land resource area:* 78C

*General location:* Eastern part of the county

*Elevation:* 1,600 to 1,800 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

**Major Component Description****Vernon and similar soils**

*Extent of the component in the map unit:* 80 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Backslopes

*Parent material:* Residuum weathered from clayey shale

*Slope:* 5 to 8 percent

*Runoff:* Very high

*Soil depth:* 20 to 40 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Very slow

*Slowest permeability class within a depth of 80 inches:* Impermeable

*Drainage class:* Well drained

*Available water capacity:* About 3.5 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Other properties:* Saline within a depth of 30 inches

*Interpretive groups:*

Land capability classification, nonirrigated—4e

Ecological site number and name—078XY031OK, Clay Prairie (south)

*Representative profile:*

A—0 to 5 inches; clay loam

Bk—5 to 13 inches; clay

BCK—13 to 26 inches; gravelly clay

Cr—26 to 39 inches; bedrock

*Location of representative profile:* About 2,550 feet north and 500 feet west of the southeast corner of sec. 20, T. 25 N., R. 21 W.

***Minor Components***

- Cottonwood and similar soils: 10 percent
- Mcknight and similar soils: 10 percent

***Management***

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**VrrB—Vernon sandy loam, 1 to 3 percent slopes, overblown*****Map Unit Setting***

*Major land resource area:* 78C

*General location:* Eastern part of the county

*Elevation:* 1,600 to 1,800 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

***Major Component Description*****Vernon and similar soils**

*Extent of the component in the map unit:* 86 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Shoulders

*Parent material:* Residuum weathered from clayey shale

*Slope:* 1 to 3 percent

*Runoff:* Very high

*Soil depth:* 20 to 40 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Very slow

*Slowest permeability class within a depth of 80 inches:* Impermeable

*Drainage class:* Well drained

*Available water capacity:* About 5.2 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3s

Ecological site number and name—078CY074OK, Shallow Sandy Prairie

*Representative profile:*

A—0 to 4 inches; sandy loam



Bw—4 to 10 inches; fine sandy loam  
 2BCK1—10 to 31 inches; channery silty clay loam  
 2BCK2—31 to 39 inches; extremely channery silty clay loam  
 2Cr—39 to 47 inches; bedrock

*Location of representative profile:* About 1,325 feet south and 100 feet west of the northeast corner of sec. 3, T. 25 N., R. 25 W.

### ***Minor Components***

- Hardeman and similar soils: 7 percent
- Grandfield and similar soils: 4 percent
- Berda and similar soils: 3 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections "Use and Management of the Soils" and "Soil Properties."

## **VrrC—Vernon sandy loam, 3 to 5 percent slopes, overblown**

### ***Map Unit Setting***

*Major land resource area:* 78C  
*General location:* Eastern part of the county  
*Elevation:* 1,600 to 1,800 feet  
*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F  
*Frost-free period:* 185 to 200 days  
*Shape of individual mapped areas:* Irregular  
*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Vernon and similar soils**

*Extent of the component in the map unit:* 76 percent  
*Geomorphic setting:* Hills on uplands  
*Position on landform:* Shoulders  
*Parent material:* Residuum weathered from clayey shale  
*Slope:* 3 to 5 percent  
*Runoff:* High  
*Soil depth:* 20 to 40 inches to paralithic bedrock  
*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
 Very slow  
*Slowest permeability class within a depth of 80 inches:* Impermeable  
*Drainage class:* Well drained  
*Available water capacity:* About 5.1 inches  
*Depth to a seasonal high water table:* More than 6 feet  
*Flooding:* None  
*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—3e  
 Ecological site number and name—078CY074OK, Shallow Sandy Prairie

*Representative profile:*

A—0 to 16 inches; sandy loam  
2Bw—16 to 22 inches; silty clay loam  
2Bk—22 to 31 inches; clay  
2BCk—31 to 37 inches; gravelly clay  
2Cr—37 to 41 inches; bedrock

*Location of representative profile:* About 2,750 feet north and 1,725 feet west of the southeast corner of sec. 9, T. 27 N., R. 21 W.

**Minor Components**

- Grandfield and similar soils: 7 percent
- Grandmore and similar soils: 7 percent
- Frankirk and similar soils: 6 percent
- Deepwood and similar soils: 4 percent

**Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**W—Water****Map Unit Setting**

*Major land resource area:* 78C  
*General location:* Throughout the county  
*Elevation:* 1,600 to 2,450 feet  
*Mean annual precipitation:* 22 to 26 inches  
*Mean annual air temperature:* 55 to 59 degrees F

**Major Component Description****Water**

*Extent of the component in the map unit:* 100 percent  
*Location of representative area:* About 800 feet north and 10 feet west of the southeast corner of sec. 15, T. 26 N., R. 25 W.

**WodA—Woods clay loam, 0 to 1 percent slopes****Map Unit Setting**

*Major land resource area:* 77E  
*General location:* Western part of the county  
*Elevation:* 2,100 to 2,450 feet  
*Mean annual precipitation:* 22 to 24 inches  
*Mean annual air temperature:* 57 to 59 degrees F  
*Frost-free period:* 185 to 200 days  
*Shape of individual mapped areas:* Irregular  
*Size of areas:* 10 to 200 acres

**Major Component Description****Woods and similar soils**

*Extent of the component in the map unit:* 80 percent  
*Geomorphic setting:* Hills on uplands

*Position on landform:* Summits

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* High

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Very slow

*Slowest permeability class within a depth of 80 inches:* Very slow

*Drainage class:* Well drained

*Available water capacity:* About 11.1 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—2s

Land capability classification, irrigated—2s

Ecological site number and name—077EY040OK, Hardland

*Representative profile:*

A—0 to 16 inches; clay loam

Bt—16 to 26 inches; clay

Btk1—26 to 42 inches; clay

Btk2—42 to 62 inches; clay

Btk3—62 to 80 inches; clay loam

*Location of representative profile:* About 50 feet north and 750 feet east of the southwest corner of sec. 6, T. 27 N., R. 24 W.

### **Minor Components**

- Abbie and similar soils: 20 percent

### **Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections "Use and Management of the Soils" and "Soil Properties."

## **WodB—Woods clay loam, 1 to 3 percent slopes**

### **Map Unit Setting**

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### **Major Component Description**

#### **Woods and similar soils**

*Extent of the component in the map unit:* 86 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Summits

*Parent material:* Alluvium

*Slope:* 1 to 3 percent

*Runoff:* Very high

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Very slow

*Slowest permeability class within a depth of 80 inches:* Very slow

*Drainage class:* Well drained

*Available water capacity:* About 11.1 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—077EY040OK, Hardland

*Representative profile:*

A—0 to 11 inches; clay loam

Bt1—11 to 26 inches; clay

Bt2—26 to 41 inches; clay

Btk—41 to 60 inches; clay loam

BCK—60 to 80 inches; clay loam

*Location of representative profile:* About 750 feet south and 3,275 feet west of the northeast corner of sec. 27, T. 28 N., R. 26 W.

### **Minor Components**

- Grandmore and similar soils: 6 percent
- Abbie and similar soils: 5 percent
- Grandfield and similar soils: 3 percent

### **Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **WodC—Woods clay loam, 3 to 5 percent slopes**

### **Map Unit Setting**

*Major land resource area:* 77E

*General location:* Western part of the county

*Elevation:* 2,100 to 2,450 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### **Major Component Description**

#### **Woods and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Shoulders

*Parent material:* Alluvium

*Slope:* 3 to 5 percent

*Runoff:* Very high

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Very slow

*Slowest permeability class within a depth of 80 inches:* Very slow

*Drainage class:* Well drained

*Available water capacity:* About 10.8 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—077EY040OK, Hardland

*Representative profile:*

A—0 to 10 inches; clay loam

BA—10 to 13 inches; clay loam

Btk—13 to 51 inches; clay

C1—51 to 69 inches; clay loam

2C2—69 to 80 inches; clay loam

*Location of representative profile:* About 5,900 feet north of the northeast corner of sec. 35, T. 25 N., R. 21 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **WQHE—Westola-Quinlan-Hardeman complex, 0 to 12 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Westola and similar soils**

*Extent of the component in the map unit:* 48 percent

*Geomorphic setting:* Flood plains in drainageways on uplands

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderate

*Drainage class:* Well drained

*Available water capacity:* About 8.9 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* Occasional

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—2w

Ecological site number and name—078XY050OK, Loamy Bottomland

*Representative profile:*

A—0 to 11 inches; loam

BC—11 to 18 inches; loam

C1—18 to 28 inches; loam

C2—28 to 34 inches; fine sandy loam

C3—34 to 80 inches; stratified loamy fine sand to loam

*Location of representative profile:* About 300 feet south and 1,000 feet west of the northeast corner of sec. 29, T. 28 N., R. 23 W.

#### **Quinlan and similar soils**

*Extent of the component in the map unit:* 30 percent

*Geomorphic setting:* Drainageways on uplands

*Position on landform:* Backslopes

*Parent material:* Residuum weathered from sandstone

*Slope:* 1 to 12 percent

*Runoff:* High

*Soil depth:* 10 to 20 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 2.6 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—078XY083OK, Shallow Prairie (north)

*Representative profile:*

A—0 to 8 inches; loam

Bw—8 to 15 inches; loam

Cr—15 to 18 inches; weathered bedrock

*Location of representative profile:* About 300 feet south and 1,100 feet west of the northeast corner of sec. 29, T. 28 N., R. 23 W.

#### **Hardeman and similar soils**

*Extent of the component in the map unit:* 22 percent

*Geomorphic setting:* Drainageways on uplands

*Position on landform:* Toeslopes

*Parent material:* Alluvium

*Slope:* 1 to 12 percent

*Runoff:* Low

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 7.8 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—6e

Ecological site number and name—078XY073OK, Sandy Prairie

*Representative profile:*

A—0 to 9 inches; loam

Bw—9 to 18 inches; loam

Bk—18 to 35 inches; fine sandy loam

BC—35 to 47 inches; fine sandy loam

C—47 to 80 inches; fine sandy loam

*Location of representative profile:* About 300 feet south and 800 feet west of the northeast corner of sec. 29, T. 28 N., R. 23 W.

### ***Management***

*Major uses:* Rangeland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **WQnB—Woodward-Quinlan complex, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Woodward and similar soils**

*Extent of the component in the map unit:* 45 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Summits

*Parent material:* Residuum weathered from sandstone

*Slope:* 1 to 3 percent

*Runoff:* Low

*Soil depth:* 20 to 40 inches to paralithic bedrock



*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 4.9 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3s

Ecological site number and name—078XY057OK, Loamy Prairie (cal)

*Representative profile:*

A—0 to 8 inches; loam

Bw—8 to 19 inches; loam

BC—19 to 25 inches; very fine sandy loam

Cr—25 to 30 inches; weathered bedrock

*Location of representative profile:* About 200 feet south and 1,350 feet west of the northeast corner of sec. 19, T. 29 N., R. 23 W.

#### **Quinlan and similar soils**

*Extent of the component in the map unit:* 43 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Summits and shoulders

*Parent material:* Residuum weathered from sandstone

*Slope:* 1 to 3 percent

*Runoff:* Medium

*Soil depth:* 10 to 20 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 3.0 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4s

Ecological site number and name—078XY083OK, Shallow Prairie (north)

*Representative profile:*

Ap—0 to 6 inches; loam

Bw—6 to 18 inches; very fine sandy loam

Cr—18 to 22 inches; weathered bedrock

*Location of representative profile:* About 250 feet south and 1,300 feet west of the northeast corner of sec. 19, T. 29 N., R. 23 W.

#### **Minor Components**

- Selman and similar soils: 7 percent
- Knoco and similar soils: 3 percent
- Hollister and similar soils: 1 percent
- Vernon and similar soils: 1 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections "Use and Management of the Soils" and "Soil Properties."

## **WQnC—Woodward-Quinlan complex, 3 to 5 percent slopes**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Throughout the county

*Elevation:* 1,800 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Woodward and similar soils**

*Extent of the component in the map unit:* 56 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Backslopes

*Parent material:* Residuum weathered from sandstone

*Slope:* 3 to 5 percent

*Runoff:* Low

*Soil depth:* 20 to 40 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 5.8 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—3e

Ecological site number and name—078XY057OK, Loamy Prairie (cal)

*Representative profile:*

Ap—0 to 7 inches; loam

Bw—7 to 30 inches; loam

Cr—30 to 35 inches; weathered bedrock

*Location of representative profile:* About 2,700 feet south and 500 feet west of the northeast corner of sec. 14, T. 28 N., R. 22 W.

#### **Quinlan and similar soils**

*Extent of the component in the map unit:* 22 percent

*Geomorphic setting:* Hills on uplands

*Position on landform:* Backslopes

*Parent material:* Residuum weathered from sandstone

*Slope:* 3 to 5 percent

*Runoff:* Medium

*Soil depth:* 10 to 20 inches to paralithic bedrock

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderate

*Slowest permeability class within a depth of 80 inches:* Moderately slow

*Drainage class:* Well drained

*Available water capacity:* About 2.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* None

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—4s

Ecological site number and name—078XY083OK, Shallow Prairie (north)

*Representative profile:*

Ap—0 to 8 inches; loam

Bw—8 to 13 inches; loam

Cr—13 to 18 inches; weathered bedrock

*Location of representative profile:* About 2,100 feet south and 500 feet west of the northeast corner of sec. 14, T. 28 N., R. 22 W.

### ***Minor Components***

- Selman and similar soils: 14 percent
- St. Paul and similar soils: 4 percent
- Deepwood and similar soils: 2 percent
- Knoco and similar soils: 2 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **Ws1A—Westola fine sandy loam, 0 to 1 percent slopes, occasionally flooded**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Along major rivers and streams

*Elevation:* 1,600 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Westola and similar soils**

*Extent of the component in the map unit:* 75 percent

*Geomorphic setting:* Flood plains in river valleys

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 8.5 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* Occasional

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—2e

Land capability classification, irrigated—2e

Ecological site number and name—078XY050OK, Loamy Bottomland

*Representative profile:*

A—0 to 8 inches; fine sandy loam

AC—8 to 16 inches; fine sandy loam

C1—16 to 27 inches; stratified loamy fine sand to fine sandy loam

C2—27 to 33 inches; clay loam

C3—33 to 80 inches; stratified fine sandy loam to loamy fine sand

*Location of representative profile:* About 450 feet south and 2,350 feet west of the northeast corner of sec. 9, T. 26 N., R. 25 W. (fig. 16)

### **Minor Components**

- Lincoln and similar soils: 11 percent
- Colorado and similar soils: 9 percent
- Yomont and similar soils: 5 percent

### **Management**

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

## **WstA—Westola fine sandy loam, 0 to 1 percent slopes, rarely flooded**

### **Map Unit Setting**

*Major land resource area:* 78C

*General location:* Along major rivers and streams

*Elevation:* 1,600 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### **Major Component Description**

#### **Westola and similar soils**

*Extent of the component in the map unit:* 88 percent

*Geomorphic setting:* Flood plains in river valleys

*Parent material:* Alluvium

*Slope:* 0 to 1 percent



Figure 16.—Profile of a soil in the Westola series.

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 8.8 inches

*Depth to a seasonal high water table:* More than 6 feet



*Flooding:* Rare

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—2e

Land capability classification, irrigated—2e

Ecological site number and name—078XY050OK, Loamy Bottomland

*Representative profile:*

A—0 to 10 inches; fine sandy loam

BC—10 to 25 inches; very fine sandy loam

BCK—25 to 43 inches; very fine sandy loam

C1—43 to 90 inches; stratified very fine sandy loam to silty clay

C2—90 to 99 inches; stratified loamy fine sand to very fine sandy loam

*Location of representative profile:* About 2,600 feet north and 1,600 feet west of the southeast corner of sec. 17, T. 27 N., R. 21 W.

**Minor Components**

- Jester and similar soils: 12 percent

**Management**

*Major uses:* Rangeland and cropland (fig. 17)

For general and detailed information about managing this map unit, see the sections “Use and Management of the Soils” and “Soil Properties.”

**YmrA—Yomont loam, 0 to 1 percent slopes, rarely flooded**

**Map Unit Setting**

*Major land resource area:* 78C

*General location:* Eastern part of the county

*Elevation:* 1,600 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F



Figure 17.—Little bluestem pasture in an area of Westola fine sandy loam, 0 to 1 percent slopes, rarely flooded.

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres

### ***Major Component Description***

#### **Yomont and similar soils**

*Extent of the component in the map unit:* 100 percent

*Geomorphic setting:* Flood plains in river valleys

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*  
Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 10.3 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* Rare

*Ponding:* None

*Interpretive groups:*

Land capability classification, nonirrigated—2e

Land capability classification, irrigated—2e

Ecological site number and name—078XY050OK, Loamy Bottomland

*Representative profile:*

A—0 to 12 inches; loam

C1—12 to 24 inches; silt loam

C2—24 to 31 inches; silt loam

C3—31 to 39 inches; silt loam

C4—39 to 80 inches; very fine sandy loam

*Location of representative profile:* About 2,200 feet south and 1,750 feet west of the northeast corner of sec. 15, T. 29 N., R. 24 W.

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections "Use and Management of the Soils" and "Soil Properties."

## **YmtA—Yomont loam, 0 to 1 percent slopes, occasionally flooded**

### ***Map Unit Setting***

*Major land resource area:* 78C

*General location:* Eastern part of the county

*Elevation:* 1,600 to 2,200 feet

*Mean annual precipitation:* 22 to 24 inches

*Mean annual air temperature:* 57 to 59 degrees F

*Frost-free period:* 185 to 200 days

*Shape of individual mapped areas:* Irregular

*Size of areas:* 10 to 200 acres



### ***Major Component Description***

#### **Yomont and similar soils**

*Extent of the component in the map unit:* 94 percent

*Geomorphic setting:* Flood plains in river valleys

*Parent material:* Alluvium

*Slope:* 0 to 1 percent

*Runoff:* Negligible

*Soil depth:* More than 60 inches

*Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:*

Moderately rapid

*Slowest permeability class within a depth of 80 inches:* Moderately rapid

*Drainage class:* Well drained

*Available water capacity:* About 10.2 inches

*Depth to a seasonal high water table:* More than 6 feet

*Flooding:* Occasional

*Ponding:* None

#### *Interpretive groups:*

Land capability classification, nonirrigated—3e

Land capability classification, irrigated—3e

Ecological site number and name—078XY050OK, Loamy Bottomland

#### *Representative profile:*

A—0 to 7 inches; loam

AC—7 to 16 inches; silt loam

C1—16 to 21 inches; loam

C2—21 to 60 inches; silt loam

2C3—60 to 80 inches; stratified sand to coarse sand

*Location of representative profile:* About 1,600 feet south and 2,000 feet east of the northwest corner of sec. 20, T. 26 N., R. 21 W.

### ***Minor Components***

- Westola and similar soils: 6 percent

### ***Management***

*Major uses:* Rangeland and cropland

For general and detailed information about managing this map unit, see the sections "Use and Management of the Soils" and "Soil Properties."

## Use and Management of the Soils

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This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Interpretive ratings help engineers, planners, and others understand how soil properties influence important nonagricultural uses, such as building site development and acquisition of construction materials. The ratings indicate the most restrictive soil features affecting the suitability of the soils for these uses.

Soils are rated in their natural state. No unusual modification of the soil site or material is made other than that which is considered normal practice for the rated use. Even though soils may have limitations, it is important to remember that engineers and others can modify soil features or can design or adjust the plans for a structure to compensate for most of the limitations. Most of these practices, however, are costly. The final decision in selecting a site for a particular use generally involves weighing the costs of site preparation and maintenance.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

### Agronomy

General management concerns affecting crops, hay, and pasture are identified in this section. The system of land capability classification used by the Natural Resources Conservation Service is explained, and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider obtaining specific information from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

## Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations that are designed to show suitability and limitations of groups of soils for rangeland, for woodland, or for engineering purposes.

In the capability system, as described in "Land Capability Classification" (USDA, 1961), soils generally are grouped at three levels: capability class, subclass, and unit. These levels indicate the degree and kinds of limitations affecting mechanized farming systems that produce the more commonly grown field crops, such as corn, small grain, cotton, hay, and field-grown vegetables. Only class and subclass are used in this survey.

*Capability classes*, the broadest groups, are designated by Arabic numerals 1 through 8. The numerals indicate progressively greater limitations and narrower choices for practical use.

If properly managed, soils in classes 1, 2, 3, and 4 are suitable for the mechanized production of commonly grown field crops and for pasture and woodland. The degree of the soil limitations affecting the production of cultivated crops increases progressively from class 1 to class 4. The limitations can affect levels of production and the risk of permanent soil deterioration caused by erosion and other factors.

Soils in classes 5, 6, and 7 are generally not suited to the mechanized production of commonly grown field crops without special management, but they are suitable for plants that provide a permanent cover, such as grasses and trees. The severity of the soil limitations affecting crops increases progressively from class 5 to class 7. The local office of the Natural Resources Conservation Service or the Cooperative Extension Service can provide guidance on the use of these soils as cropland.

Areas in class 8 are generally not suitable for crops, pasture, rangeland, or woodland. These areas may have potential for other uses, such as recreational facilities and wildlife habitat.

*Capability subclasses* identify the dominant kind of limitation in the class. They are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, 2*e*. The letter *e* shows that the main hazard is the risk of erosion unless a close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

There are no subclasses in class 1 because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use mainly to pasture, rangeland, woodland, wildlife habitat, or recreation.

The capability classification of each map unit is given in tables 5 and 6, "Land Capability and Yields per Acre of Crops" and "Land Capability and Yields per Acre of Hay and Pasture."

Table 5.--Land Capability and Yields per Acre of Crops

[Yields in the "N" columns are for nonirrigated areas; those in the "I" columns are for irrigated areas. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Map symbol and soil name	Land capability		Alfalfa hay		Corn		Corn silage		Grain sorghum		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Tons	Tons	Bu	Bu	Bu	Bu
AbbA: Abbie-----	1	1	3.5	6.0	80	170	10	20	45	110	33	60
AbbB: Abbie-----	2e	2e	3.5	6.0	80	170	10	20	45	110	33	60
AbbB2: Abbie-----	3e	3e	3.0	5.5	70	150	10	20	40	100	30	55
AbbC: Abbie-----	3e	3e	3.0	5.5	70	150	10	20	40	100	30	55
AbbC2: Abbie-----	3e	3e	2.5	5.0	60	140	8	17	35	90	25	45
AbsB: Abilene-----	2e	2e	3.0	6.0	60	170	9	18	30	110	25	50
AclA: Abbie-----	1	1	3.5	6.0	80	170	10	20	45	110	33	60
AflB: Abbie-----	2e	2e	3.5	6.0	80	170	10	20	45	110	33	60
AflC: Abbie-----	3e	3e	3.0	5.5	70	150	10	20	40	100	30	55
BdaB: Berda-----	3e	3e	3.5	6.0	70	150	6	15	25	75	20	50
BdaC: Berda-----	3e	3e	2.5	4.5	60	140	6	15	25	75	20	40
BdaD: Berda-----	4e	4e	2.0	4.0	50	130	5	12	20	65	15	35
CRVE: Cottonwood-----	7s	---	---	---	---	---	---	---	---	---	---	---
Rock outcrop-----	8	---	---	---	---	---	---	---	---	---	---	---

Table 5.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Corn		Corn silage		Grain sorghum		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Tons	Tons	Bu	Bu	Bu	Bu
CRVE: Vinson-----	3e	---	---	---	---	---	---	---	---	---	---	---
DAM: Dam-----	8	---	---	---	---	---	---	---	---	---	---	---
DevE: Devol-----	6e	---	---	---	---	---	---	---	---	---	---	---
DpwB: Deepwood-----	2e	---	2.0	---	---	---	---	---	20	---	25	---
DpwC: Deepwood-----	3e	---	2.0	---	---	---	---	---	20	---	25	---
DpwD: Deepwood-----	4e	---	1.5	---	---	---	---	---	18	---	23	---
DpwE: Deepwood-----	6e	---	---	---	---	---	---	---	---	---	---	---
DvlB: Devol-----	3e	3e	3.5	6.0	80	170	7	15	30	80	25	35
DvlC: Devol-----	3e	3e	3.5	6.0	80	170	7	15	30	80	25	35
DvlD: Devol-----	4e	4e	3.0	5.0	80	170	6	14	28	70	15	30
EdlC: Eda-----	4e	---	---	---	---	---	---	---	---	---	18	---
EdlE: Eda-----	6e	---	---	---	---	---	---	---	---	---	---	---
FayB: Farry-----	2e	2e	3.0	5.0	80	170	10	20	38	100	30	55
FayC: Farry-----	3e	3e	2.8	5.0	70	160	8	18	35	90	28	50

Table 5.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Corn		Corn silage		Grain sorghum		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Tons	Tons	Bu	Bu	Bu	Bu
FoFE: Fortyone-----	6e	---	---	---	---	---	---	---	---	---	---	---
Farry-----	6e	---	---	---	---	---	---	---	---	---	---	---
FrkA: Frankirk-----	1	1	3.0	6.0	60	170	9	18	30	110	25	50
FrkB: Frankirk-----	2e	2e	3.0	6.0	60	170	9	18	30	110	25	50
FtnB: Fortyone-----	3s	2e	3.0	5.5	50	140	8	18	30	65	22	50
FtnC: Fortyone-----	3e	3e	3.0	4.5	45	130	7	17	30	80	23	45
FtnD: Fortyone-----	4e	4e	2.8	4.0	40	120	7	15	25	70	20	40
GcsA: Gracemore-----	4w	4w	3.0	4.5	50	150	10	20	35	90	20	40
GdfB: Grandfield-----	2e	2e	3.0	5.5	70	150	10	20	30	80	25	45
GdfC: Grandfield-----	3e	3e	3.0	5.5	70	150	10	20	30	80	25	45
GDGE: Grandfield-----	4e	---	---	---	---	---	---	---	---	---	25	---
Devol-----	6e	---	---	---	---	---	---	---	---	---	---	---
Grandmore-----	3e	---	---	---	---	---	---	---	---	---	25	---
GdmB: Grandmore-----	3e	3e	3.0	5.5	70	150	10	20	30	80	25	45
GfsA: Gracemore-----	4w	---	---	---	---	---	---	---	---	---	6	---
GmrA: Gracemont-----	4w	4w	3.0	4.5	60	140	10	20	35	90	25	50

Table 5.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Corn		Corn silage		Grain sorghum		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Tons	Tons	Bu	Bu	Bu	Bu
GmsA: Gracemont-----	4w	---	---	---	---	---	---	---	---	---	7	---
GrmA: Gracemore-----	4w	---	---	---	---	---	---	---	---	---	6	---
HdGB: Hardeman-----	3e	3e	3.0	5.5	50	140	8	18	30	65	22	50
Grandmore-----	3e	3e	3.0	5.5	70	150	10	20	30	80	25	45
HdGC: Hardeman-----	3e	3e	3.0	5.5	50	140	8	18	30	65	22	50
Grandmore-----	3e	3e	3.0	5.5	70	150	10	20	30	80	25	45
HdmB: Hardeman-----	3e	3e	3.0	5.5	50	140	8	18	30	65	22	50
HdmC: Hardeman-----	3e	3e	3.0	5.5	50	140	8	18	30	65	22	50
IreA: Irene-----	1	1	3.5	6.0	80	170	10	20	45	110	33	60
IreB: Irene-----	2e	2e	3.5	6.0	80	170	10	20	45	110	33	60
IreC: Irene-----	3e	3e	3.0	5.5	70	150	10	20	40	100	30	55
IreD: Irene-----	4e	4e	2.5	5.0	60	140	8	17	35	90	25	45
JssF: Jester-----	6e	---	---	---	---	---	---	---	---	---	---	---
JstC: Jester-----	4e	---	---	---	---	---	---	---	---	---	2	---
KidB: Kingsdown-----	2e	2e	3.0	5.5	50	140	8	18	30	65	22	50



Table 5.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Corn		Corn silage		Grain sorghum		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Tons	Tons	Bu	Bu	Bu	Bu
KiHE:												
Kingsdown-----	4e	---	---	---	---	---	---	---	---	---	22	---
Hardeman-----	6e	---	---	---	---	---	---	---	---	---	---	---
LgtA:												
Lugert-----	2w	---	3.0	---	---	---	---	---	40	---	35	---
LiJC:												
Lincoln-----	3s	---	---	---	---	---	---	---	---	---	20	---
Jester-----	4e	---	---	---	---	---	---	---	---	---	2	---
LikB:												
Likes-----	3s	3e	---	---	---	---	---	---	---	---	3	25
LisA:												
Lincoln-----	5w	---	---	---	---	---	---	---	---	---	---	---
LncA:												
Lincoln-----	3s	2e	2.5	5.0	---	---	---	---	25	50	20	40
LROE:												
Laverne-----	7s	---	---	---	---	---	---	---	---	---	---	---
Rock outcrop-----	8	---	---	---	---	---	---	---	---	---	---	---
LshA:												
Lesho-----	3e	2e	2.7	5.5	---	---	---	---	27	55	22	45
LsoA:												
Lincoln-----	3s	---	2.0	---	---	---	---	---	20	---	17	---
M-W:												
Water.												
MLBB:												
Mobeetie-----	3e	3e	3.0	5.5	50	160	8	18	30	80	22	50
Likes-----	3e	3e	---	4.5	---	80	---	15	---	50	3	25
Berda-----	3e	3e	3.5	6.0	70	160	6	15	25	75	20	50

Table 5.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Corn		Corn silage		Grain sorghum		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Tons	Tons	Bu	Bu	Bu	Bu
MLBC:												
Mobeetie-----	3e	3e	3.0	5.5	50	160	8	18	30	65	22	50
Likes-----	3e	3e	---	4.5	---	80	---	15	---	50	3	25
Berda-----	3e	3e	2.5	4.5	60	150	6	15	25	75	20	40
MLBE:												
Mobeetie-----	6e	---	---	---	---	---	---	---	---	---	---	---
Likes-----	6e	---	---	---	---	---	---	---	---	---	---	---
Berda-----	6e	---	---	---	---	---	---	---	---	---	---	---
MnsB:												
Mansic-----	2e	2e	3.5	6.0	70	150	6	15	25	75	20	50
MnsC:												
Mansic-----	3e	3e	2.5	4.5	60	140	6	15	25	75	20	40
MsnB:												
Manson-----	2e	2e	3.0	5.5	70	160	5	15	20	50	18	25
MsnC:												
Manson-----	3e	3e	3.0	5.5	70	160	5	15	20	50	18	25
MsnC2:												
Manson-----	3e	3e	2.5	4.5	50	140	3.5	11	15	40	12	18
OMBE:												
Oklark-----	6e	---	---	---	---	---	---	---	---	---	---	---
Mansic-----	6e	---	---	---	---	---	---	---	---	---	---	---
Berda-----	6e	---	---	---	---	---	---	---	---	---	---	---
OMBG:												
Oklark-----	7e	---	---	---	---	---	---	---	---	---	---	---
Mansic-----	7e	---	---	---	---	---	---	---	---	---	---	---
Berda-----	7e	---	---	---	---	---	---	---	---	---	---	---
PdoA:												
Paloduro-----	2e	2e	2.8	5.0	60	150	5	15	20	40	15	45

Table 5.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Corn		Corn silage		Grain sorghum		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Tons	Tons	Bu	Bu	Bu	Bu
PdoB: Paloduro-----	2e	2e	2.8	5.0	60	150	5	15	20	40	15	45
PdoC2: Paloduro-----	3e	3e	2.0	4.0	50	145	4.2	12	15	30	10	30
PIT: Pits-----	8	---	---	---	---	---	---	---	---	---	---	---
PlmB: Plemons-----	3e	3e	3.0	5.5	70	160	5	15	20	50	18	25
PlmC: Plemons-----	3e	3e	3.0	5.5	70	160	5	15	20	50	18	25
PlmD: Plemons-----	4e	---	---	---	---	---	---	---	---	---	---	---
QnWC3: Quinlan-----	6e	---	---	---	---	---	---	---	---	---	---	---
Woodward-----	6e	---	---	---	---	---	---	---	---	---	---	---
QnWD: Quinlan-----	4e	---	1.0	---	---	---	---	---	15	---	15	---
Woodward-----	4e	---	2.0	---	---	---	---	---	20	---	20	---
QnWE: Quinlan-----	6e	---	---	---	---	---	---	---	---	---	---	---
Woodward-----	6e	---	---	---	---	---	---	---	---	---	---	---
QRWG: Quinlan-----	7e	---	---	---	---	---	---	---	---	---	---	---
Rock outcrop-----	8	---	---	---	---	---	---	---	---	---	---	---
Woodward-----	6e	---	---	---	---	---	---	---	---	---	---	---

Table 5.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Corn		Corn silage		Grain sorghum		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Tons	Tons	Bu	Bu	Bu	Bu
QRYG:												
Quinlan-----	7e	---	---	---	---	---	---	---	---	---	---	---
Rock outcrop-----	8	---	---	---	---	---	---	---	---	---	---	---
Yomont-----	5w	---	---	---	---	---	---	---	---	---	---	---
QWDE:												
Quinlan-----	6e	---	---	---	---	---	---	---	---	---	---	---
Woodward-----	6e	---	---	---	---	---	---	---	---	---	---	---
Deepwood-----	6e	---	---	---	---	---	---	---	---	---	---	---
QWRC:												
Quinlan-----	4s	---	---	---	---	---	---	---	---	---	10	---
Woodward-----	3e	---	---	---	---	---	---	---	---	---	15	---
Rock outcrop-----	8	---	---	---	---	---	---	---	---	---	---	---
RoCH:												
Rock outcrop-----	8	---	---	---	---	---	---	---	---	---	---	---
Cottonwood-----	7s	---	---	---	---	---	---	---	---	---	---	---
RssA:												
Rosston-----	5w	---	---	---	---	---	---	---	20	---	10	---
SAL:												
Salt flats-----	8	---	---	---	---	---	---	---	---	---	---	---
SelA:												
Selman-----	1	1	3.5	6.0	80	170	10	20	45	110	33	60
SelB:												
Selman-----	2e	2e	3.5	6.0	80	170	10	20	45	110	33	60
SelC:												
Selman-----	3e	3e	3.0	5.5	70	150	10	20	40	100	30	55
SelC2:												
Selman-----	3e	3e	2.5	5.0	60	140	8	17	35	90	25	45

Table 5.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Corn		Corn silage		Grain sorghum		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Tons	Tons	Bu	Bu	Bu	Bu
SelD: Selman-----	4e	4e	2.5	5.0	60	140	8	17	35	90	25	45
SelD2: Selman-----	4e	4e	2.0	4.0	50	130	6	15	30	80	20	40
SprA: Spur-----	2e	2e	3.5	6.0	60	160	9	15	25	110	30	60
SpsA: Spur-----	3s	---	---	---	---	---	---	---	---	---	---	---
StpA: St. Paul-----	1	1	3.5	6.0	80	170	10	20	45	110	33	60
StpB: St. Paul-----	2e	2e	3.5	6.0	80	170	10	20	45	110	33	60
StpC: St. Paul-----	3e	3e	3.0	5.5	70	150	10	20	40	100	30	55
StpD: St. Paul-----	4e	4e	2.5	5.0	60	140	8	17	35	90	25	45
TeWE: Teagard-----	6e	---	---	---	---	---	---	---	---	---	---	---
Wellsford-----	6e	---	---	---	---	---	---	---	---	---	---	---
TexA: Texroy-----	1	1	3.5	6.0	80	170	10	20	45	110	33	60
TexB: Texroy-----	2e	2e	3.5	6.0	80	170	10	20	45	110	33	60
TexC: Texroy-----	3e	3e	3.0	5.5	70	150	10	20	40	100	30	55
TipA: Tipton-----	1	1	3.5	6.0	80	170	10	20	45	110	33	60
TipB: Tipton-----	2e	2e	3.5	6.0	80	170	10	20	45	110	33	60

Table 5.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Corn		Corn silage		Grain sorghum		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Tons	Tons	Bu	Bu	Bu	Bu
TipC: Tipton-----	3e	3e	3.0	5.5	70	150	10	20	40	100	30	55
TipD: Tipton-----	4e	4e	2.5	5.0	60	140	8	17	35	90	25	45
TRQC: Talpa-----	4s	---	---	---	---	---	---	---	---	---	7	---
Rock outcrop-----	8	---	---	---	---	---	---	---	---	---	---	---
Quinlan-----	4s	---	---	---	---	---	---	---	---	---	15	---
TvlC: Tivoli-----	4e	---	---	---	---	---	---	---	---	---	2	---
TvlE: Tivoli-----	6e	---	---	---	---	---	---	---	---	---	---	---
TvlG: Tivoli-----	7e	---	---	---	---	---	---	---	---	---	---	---
VerB: Vernon-----	3s	---	2.0	---	---	---	---	---	25	---	16	---
VerC: Vernon-----	4e	---	2.0	---	---	---	---	---	25	---	16	---
VerD: Vernon-----	4e	---	---	---	---	---	---	---	---	---	9	---
VrrB: Vernon-----	3s	---	2.0	---	---	---	---	---	30	---	20	---
VrrC: Vernon-----	3e	---	2.0	---	---	---	---	---	25	---	20	---
W: Water-----	8	---	---	---	---	---	---	---	---	---	---	---
WodA: Woods-----	2s	2s	3.0	6.0	60	170	9	18	30	110	25	50
WodB: Woods-----	3e	3e	3.0	6.0	60	170	9	18	30	110	25	50

Table 5.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Corn		Corn silage		Grain sorghum		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Tons	Tons	Bu	Bu	Bu	Bu
WodC: Woods-----	3e	3e	3.0	6.0	50	160	7	15	28	100	23	45
WQHE: Westola-----	2w	---	---	---	---	---	---	---	---	---	30	45
Quinlan-----	6e	---	---	---	---	---	---	---	---	---	---	---
Hardeman-----	6e	---	---	---	---	---	---	---	---	---	---	---
WQnB: Woodward-----	3s	---	2.0	---	---	---	---	---	20	---	20	---
Quinlan-----	4s	---	1.0	---	---	---	---	---	15	---	15	---
WQnC: Woodward-----	3e	---	2.0	---	---	---	---	---	20	---	20	---
Quinlan-----	4s	---	1.0	---	---	---	---	---	15	---	15	---
WslA: Westola-----	2e	2e	4.5	6.0	---	---	---	---	50	90	30	45
WstA: Westola-----	2e	2e	5.0	6.5	---	---	---	---	55	100	30	45
YmrA: Yomont-----	2e	2e	5.0	6.5	---	---	---	---	55	110	30	60
YmtA: Yomont-----	3e	3e	4.5	6.0	---	---	---	---	50	100	30	60



Table 6.--Land Capability and Yields per Acre of Hay and Pasture

[Yields in the "N" columns are for nonirrigated areas; those in the "I" columns are for irrigated areas. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Map symbol and soil name	Land capability		Introduced bluestem		Small grains grazeout		Sorghum hay	
	N	I	N	I	N	I	N	I
			<i>AUM</i>	<i>AUM</i>	<i>AUM</i>	<i>AUM</i>	<i>Tons</i>	<i>Tons</i>
AbbA: Abbie-----	1	1	6.0	---	4.1	---	7.0	---
AbbB: Abbie-----	2e	2e	6.0	---	4.1	---	7.0	---
AbbB2: Abbie-----	3e	3e	6.0	---	3.8	---	7.0	---
AbbC: Abbie-----	3e	3e	6.0	---	3.8	---	7.0	---
AbbC2: Abbie-----	3e	3e	5.0	---	3.1	---	6.0	---
AbsB: Abilene-----	2e	2e	4.5	---	3.3	---	5.5	---
AclA: Abbie-----	1	1	6.0	---	4.1	---	7.0	---
AflB: Abbie-----	2e	2e	6.0	---	4.1	---	7.0	---
AflC: Abbie-----	3e	3e	6.0	---	3.8	---	7.0	---
BdaB: Berda-----	3e	3e	2.5	---	3.1	---	3.0	---
BdaC: Berda-----	3e	3e	2.2	---	3.1	---	3.0	---
BdaD: Berda-----	4e	4e	2.0	---	3.0	---	3.0	---
CRVE: Cottonwood-----	7s	---	---	---	---	---	---	---
Rock outcrop-----	8	---	---	---	---	---	---	---
Vinson-----	3e	---	---	---	---	---	---	---
DAM: Dam-----	8	---	---	---	---	---	---	---
DevE: Devol-----	6e	---	---	---	---	---	---	---
DpwB: Deepwood-----	2e	---	3.5	---	3.6	---	5.0	---
DpwC: Deepwood-----	3e	---	3.5	---	3.6	---	5.0	---

Table 6.--Land Capability and Yields per Acre of Hay and Pasture--Continued

Map symbol and soil name	Land capability		Introduced bluestem		Small grains grazeout		Sorghum hay	
	N	I	N	I	N	I	N	I
			<i>AUM</i>	<i>AUM</i>	<i>AUM</i>	<i>AUM</i>	<i>Tons</i>	<i>Tons</i>
DpwD: Deepwood-----	4e	---	3.2	---	3.1	---	3.5	---
DpwE: Deepwood-----	6e	---	---	---	---	---	---	---
DvlB: Devol-----	3e	3e	4.5	---	3.3	---	5.0	---
DvlC: Devol-----	3e	3e	4.5	---	3.3	---	5.0	---
DvlD: Devol-----	4e	4e	4.0	---	2.8	---	4.0	---
EdlC: Eda-----	4e	---	---	---	---	---	---	---
EdlE: Eda-----	6e	---	---	---	---	---	---	---
FayB: Farry-----	2e	2e	4.1	---	4.1	---	5.5	---
FayC: Farry-----	3e	3e	4.1	---	3.8	---	5.5	---
FoFE: Fortyone-----	6e	---	---	---	---	---	---	---
Farry-----	6e	---	---	---	---	---	---	---
FrkA: Frankirk-----	1	1	4.5	---	3.3	---	5.5	---
FrkB: Frankirk-----	2e	2e	4.5	---	3.3	---	5.5	---
FtnB: Fortyone-----	3s	2e	3.5	---	3.6	---	5.0	---
FtnC: Fortyone-----	3e	3e	3.5	---	3.8	---	4.5	---
FtnD: Fortyone-----	4e	4e	3.5	---	3.6	---	4.0	---
GcsA: Gracemore-----	4w	4w	4.0	---	3.1	---	3.5	---
GdfB: Grandfield-----	2e	2e	5.5	---	3.8	---	6.0	---
GdfC: Grandfield-----	3e	3e	5.5	---	3.8	---	6.0	---

Table 6.--Land Capability and Yields per Acre of Hay and Pasture--Continued

Map symbol and soil name	Land capability		Introduced bluestem		Small grains grazeout		Sorghum hay	
	N	I	N	I	N	I	N	I
			<i>AUM</i>	<i>AUM</i>	<i>AUM</i>	<i>AUM</i>	<i>Tons</i>	<i>Tons</i>
GDGE:								
Grandfield-----	4e	---	---	---	---	---	---	---
Devol-----	6e	---	---	---	---	---	---	---
Grandmore-----	3e	---	---	---	---	---	---	---
GdmB:								
Grandmore-----	3e	3e	5.5	---	3.8	---	6.0	---
GfsA:								
Gracemore-----	4w	---	---	---	---	---	---	---
GmrA:								
Gracemont-----	4w	4w	4.0	---	3.8	---	3.9	---
GmsA:								
Gracemont-----	4w	---	---	---	---	---	---	---
GrmA:								
Gracemore-----	4w	---	---	---	---	---	---	---
HdGB:								
Hardeman-----	3e	3e	3.5	---	3.6	---	5.0	---
Grandmore-----	3e	3e	5.5	---	3.8	---	6.0	---
HdGC:								
Hardeman-----	3e	3e	3.5	---	3.6	---	5.0	---
Grandmore-----	3e	3e	5.5	---	3.8	---	6.0	---
HdmB:								
Hardeman-----	3e	3e	3.5	---	3.6	---	5.0	---
HdmC:								
Hardeman-----	3e	3e	3.5	---	3.6	---	5.0	---
IreA:								
Irene-----	1	1	6.0	---	4.1	---	7.0	---
IreB:								
Irene-----	2e	2e	6.0	---	4.1	---	7.0	---
IreC:								
Irene-----	3e	3e	6.0	---	3.8	---	7.0	---
IreD:								
Irene-----	4e	4e	5.0	---	3.1	---	6.0	---
JssF:								
Jester-----	6e	---	---	---	---	---	---	---
JstC:								
Jester-----	4e	---	---	---	---	---	---	---
KidB:								
Kingsdown-----	2e	2e	3.5	---	3.6	---	5.0	---

Table 6.--Land Capability and Yields per Acre of Hay and Pasture--Continued

Map symbol and soil name	Land capability		Introduced bluestem		Small grains grazeout		Sorghum hay	
	N	I	N	I	N	I	N	I
			<i>AUM</i>	<i>AUM</i>	<i>AUM</i>	<i>AUM</i>	<i>Tons</i>	<i>Tons</i>
KiHE:								
Kingsdown-----	4e	---	---	---	---	---	---	---
Hardeman-----	6e	---	---	---	---	---	---	---
LgtA:								
Lugert-----	2w	---	5.5	---	4.1	---	3.9	---
LiJC:								
Lincoln-----	3s	---	---	---	---	---	---	---
Jester-----	4e	---	---	---	---	---	---	---
LikB:								
Likes-----	3s	3e	---	---	---	---	---	---
LisA:								
Lincoln-----	5w	---	---	---	---	---	---	---
LncA:								
Lincoln-----	3s	2e	4.0	---	2.6	---	---	---
LROE:								
Laverne-----	7s	---	---	---	---	---	---	---
Rock outcrop-----	8	---	---	---	---	---	---	---
LshA:								
Lesho-----	3e	2e	4.5	---	2.8	---	---	---
LsoA:								
Lincoln-----	3s	---	3.0	---	3.1	---	2.5	---
M-W:								
Water.								
MLBB:								
Mobeetie-----	3e	3e	3.5	---	3.6	---	5.0	---
Likes-----	3e	3e	2.0	---	---	2.6	---	2.5
Berda-----	3e	3e	2.5	---	3.1	---	3.0	---
MLBC:								
Mobeetie-----	3e	3e	3.5	---	3.6	---	5.0	---
Likes-----	3e	3e	2.0	---	---	2.6	---	2.5
Berda-----	3e	3e	2.2	---	3.1	---	3.0	---
MLBE:								
Mobeetie-----	6e	---	---	---	---	---	---	---
Likes-----	6e	---	---	---	---	---	---	---
Berda-----	6e	---	---	---	---	---	---	---
MnsB:								
Mansic-----	2e	2e	2.5	---	3.1	---	3.0	---

Table 6.--Land Capability and Yields per Acre of Hay and Pasture--Continued

Map symbol and soil name	Land capability		Introduced bluestem		Small grains grazeout		Sorghum hay	
	N	I	N	I	N	I	N	I
			<i>AUM</i>	<i>AUM</i>	<i>AUM</i>	<i>AUM</i>	<i>Tons</i>	<i>Tons</i>
MnsC: Mansic-----	3e	3e	2.2	---	3.1	---	3.0	---
MsnB: Manson-----	2e	2e	2.5	---	3.1	---	3.0	---
MsnC: Manson-----	3e	3e	2.5	---	3.1	---	3.0	---
MsnC2: Manson-----	3e	3e	2.0	---	2.6	---	2.5	---
OMBE: OkIark-----	6e	---	---	---	---	---	---	---
Mansic-----	6e	---	---	---	---	---	---	---
Berda-----	6e	---	---	---	---	---	---	---
OMBG: OkIark-----	7e	---	---	---	---	---	---	---
Mansic-----	7e	---	---	---	---	---	---	---
Berda-----	7e	---	---	---	---	---	---	---
PdoA: Paloduro-----	2e	2e	2.5	---	2.8	---	4.0	---
PdoB: Paloduro-----	2e	2e	2.5	---	2.8	---	4.0	---
PdoC2: Paloduro-----	3e	3e	2.0	---	2.6	---	3.0	---
PIT: Pits-----	8	---	---	---	---	---	---	---
PlmB: Plemons-----	3e	3e	2.5	---	3.1	---	3.0	---
PlmC: Plemons-----	3e	3e	2.5	---	3.1	---	3.0	---
PlmD: Plemons-----	4e	---	---	---	---	---	---	---
QnWC3: Quinlan-----	6e	---	---	---	---	---	---	---
Woodward-----	6e	---	---	---	---	---	---	---
QnWD: Quinlan-----	4e	---	2.5	---	3.1	---	2.0	---
Woodward-----	4e	---	3.5	---	3.6	---	2.5	---

Table 6.--Land Capability and Yields per Acre of Hay and Pasture--Continued

Map symbol and soil name	Land capability		Introduced bluestem		Small grains grazeout		Sorghum hay	
	N	I	N	I	N	I	N	I
			<i>AUM</i>	<i>AUM</i>	<i>AUM</i>	<i>AUM</i>	<i>Tons</i>	<i>Tons</i>
QnWE:								
Quinlan-----	6e	---	---	---	---	---	---	---
Woodward-----	6e	---	---	---	---	---	---	---
QRWG:								
Quinlan-----	7e	---	---	---	---	---	---	---
Rock outcrop-----	8	---	---	---	---	---	---	---
Woodward-----	6e	---	---	---	---	---	---	---
QRYG:								
Quinlan-----	7e	---	---	---	---	---	---	---
Rock outcrop-----	8	---	---	---	---	---	---	---
Yomont-----	5w	---	---	---	---	---	---	---
QWDE:								
Quinlan-----	6e	---	---	---	---	---	---	---
Woodward-----	6e	---	---	---	---	---	---	---
Deepwood-----	6e	---	---	---	---	---	---	---
QWRC:								
Quinlan-----	4s	---	---	---	---	---	---	---
Woodward-----	3e	---	---	---	---	---	---	---
Rock outcrop-----	8	---	---	---	---	---	---	---
RoCH:								
Rock outcrop-----	8	---	---	---	---	---	---	---
Cottonwood-----	7s	---	---	---	---	---	---	---
RssA:								
Rosston-----	5w	---	---	---	---	---	---	---
SAL:								
Salt flats-----	8	---	---	---	---	---	---	---
SelA:								
Selman-----	1	1	6.0	---	4.1	---	7.0	---
SelB:								
Selman-----	2e	2e	6.0	---	4.1	---	7.0	---
SelC:								
Selman-----	3e	3e	6.0	---	3.8	---	7.0	---
SelC2:								
Selman-----	3e	3e	5.0	---	3.1	---	6.0	---
SelD:								
Selman-----	4e	4e	5.0	---	3.1	---	6.0	---

Table 6.--Land Capability and Yields per Acre of Hay and Pasture--Continued

Map symbol and soil name	Land capability		Introduced bluestem		Small grains grazeout		Sorghum hay	
	N	I	N	I	N	I	N	I
			<i>AUM</i>	<i>AUM</i>	<i>AUM</i>	<i>AUM</i>	<i>Tons</i>	<i>Tons</i>
SelD2: Selman-----	4e	4e	4.0	---	2.6	---	4.5	---
SprA: Spur-----	2e	2e	5.5	---	3.8	---	4.1	---
SpsA: Spur-----	3s	---	---	---	---	---	---	---
StpA: St. Paul-----	1	1	6.0	---	4.1	---	7.0	---
StpB: St. Paul-----	2e	2e	6.0	---	4.1	---	7.0	---
StpC: St. Paul-----	3e	3e	6.0	---	3.8	---	7.0	---
StpD: St. Paul-----	4e	4e	5.0	---	3.1	---	6.0	---
TeWE: Teagard-----	6e	---	---	---	---	---	---	---
Wellsford-----	6e	---	---	---	---	---	---	---
TexA: Texroy-----	1	1	6.0	---	4.1	---	7.0	---
TexB: Texroy-----	2e	2e	6.0	---	4.1	---	7.0	---
TexC: Texroy-----	3e	3e	6.0	---	3.8	---	7.0	---
TipA: Tipton-----	1	1	6.0	---	4.1	---	7.0	---
TipB: Tipton-----	2e	2e	6.0	---	4.1	---	7.0	---
TipC: Tipton-----	3e	3e	6.0	---	3.8	---	7.0	---
TipD: Tipton-----	4e	4e	5.0	---	3.1	---	6.0	---
TRQC: Talpa-----	4s	---	---	---	---	---	---	---
Rock outcrop-----	8	---	---	---	---	---	---	---
Quinlan-----	4s	---	---	---	---	---	---	---
TvlC: Tivoli-----	4e	---	---	---	---	---	---	---
TvlE: Tivoli-----	6e	---	---	---	---	---	---	---



Table 6.--Land Capability and Yields per Acre of Hay and Pasture--Continued

Map symbol and soil name	Land capability		Introduced bluestem		Small grains grazeout		Sorghum hay	
	N	I	N	I	N	I	N	I
			AUM	AUM	AUM	AUM	Tons	Tons
TvlG: Tivoli-----	7e	---	---	---	---	---	---	---
VerB: Vernon-----	3s	---	3.5	---	3.3	---	2.5	---
VerC: Vernon-----	4e	---	3.0	---	2.8	---	2.0	---
VerD: Vernon-----	4e	---	---	---	---	---	---	---
VrrB: Vernon-----	3s	---	3.0	---	3.1	---	2.5	---
VrrC: Vernon-----	3e	---	3.0	---	3.1	---	2.0	---
W: Water-----	8	---	---	---	---	---	---	---
WodA: Woods-----	2s	2s	4.5	---	3.3	---	5.5	---
WodB: Woods-----	3e	3e	4.5	---	3.3	---	5.5	---
WodC: Woods-----	3e	3e	4.5	---	3.0	---	5.0	---
WQHE: Westola-----	2w	---	---	---	---	---	---	---
Quinlan-----	6e	---	---	---	---	---	---	---
Hardeman-----	6e	---	---	---	---	---	---	---
WQnB: Woodward-----	3s	---	4.5	---	3.6	---	4.0	---
Quinlan-----	4s	---	2.5	---	3.1	---	2.0	---
WQnC: Woodward-----	3e	---	3.5	---	3.6	---	2.5	---
Quinlan-----	4s	---	2.5	---	3.1	---	2.0	---
WslA: Westola-----	2e	2e	4.7	---	4.1	---	3.9	---
WstA: Westola-----	2e	2e	5.0	---	3.1	---	3.9	---
YmrA: Yomont-----	2e	2e	5.0	---	4.1	---	3.9	---
YmtA: Yomont-----	3e	3e	4.7	---	4.1	---	3.9	---

## **Estimated Yields of Crops, Pasture, and Hay**

The average yields per acre that can be expected of the principal crops under a high level of management are shown in the tables 5 and 6, "Land Capability and Yields per Acre of Crops" and "Land Capability and Yields per Acre of Hay and Pasture." In any given year, yields may be higher or lower than those indicated in the tables because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the tables.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good-quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in the table are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small.

Under good pasture management, proper grazing is essential for the production of high-quality forage, stand survival, and erosion control. Proper grazing helps plants to maintain sufficient and generally vigorous top growth during the growing season. Brush control is essential in many areas, and weed control generally is needed. Rotation grazing and renovation also are important management practices.

Yield estimates are often indicated in animal unit months (AUM), or the amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about forage yields other than those shown in the tables.

## **Cropland Limitations and Hazards**

The management concerns affecting the use of the detailed map units in the survey area for crops are shown in table 7, "Cropland Limitations and Hazards." The main concerns in managing nonirrigated cropland are conserving moisture, controlling soil blowing and water erosion, and maintaining soil fertility and tilth.

Conserving moisture primarily involves reducing the rates of evaporation and runoff and increasing the rate of water infiltration. Applying conservation tillage and conservation cropping systems, farming on the contour, stripcropping, establishing field windbreaks, and leaving crop residue on the surface conserve moisture.

Generally, a combination of several practices is needed to control soil blowing and water erosion. Conservation tillage, stripcropping, field windbreaks, tall grass barriers, contour farming, conservation cropping systems, crop residue management, diversions, and grassed waterways help to prevent excessive soil loss.

Measures that are effective in maintaining soil fertility include applying fertilizer, both organic and inorganic, including manure; incorporating crop residue or green manure crops into the soil; and using proper crop rotations. Controlling erosion helps to prevent the loss of organic matter and plant nutrients and thus helps to maintain productivity, although the level of fertility can be reduced even in areas where erosion is controlled. All soils used for nonirrigated crops respond well to applications of fertilizer.

On irrigated soils the main management concerns are efficient water use, nutrient management, control of erosion, soil tilth, pest and weed control, and timely planting and harvesting. An irrigation system that provides optimum control and distribution of water at minimum cost is needed. Overirrigation wastes water, leaches plant nutrients, and causes erosion. Also, it can create drainage problems, raise the water table, and increase soil salinity.

Some of the limitations and hazards shown in the table cannot be easily overcome. These are *flooding*, *depth to rock*, and *ponding*.

Additional limitations and hazards are as follows:

*Excessive permeability.*—This limitation causes deep leaching of nutrients and pesticides. The capacity of the soil to retain moisture for plant use is poor.

*Potential for ground-water pollution.*—This is a hazard in soils with excessive permeability, hard bedrock, or a water table within the profile.

*Lime content, limited available water capacity, poor tilth, restricted permeability, and surface crusting.*—The adverse effects of these limitations can be reduced by incorporating green manure crops, manure, or crop residue into the soil; applying a system of conservation tillage; and using conservation cropping systems. Also, crops may respond well to additions of phosphate fertilizer to soils that have a high content of lime.

*Slope.*—Where the slope is more than 8 percent, water erosion and soil blowing may be accelerated unless conservation farming practices are applied.

*Salt and sodium content.*—In areas where this is a limitation, only salt- and sodium-tolerant crops should be grown.

### **Criteria for Limitations and Hazards**

Following are the criteria used to determine the limitations and hazards.

*Depth to rock.*—Bedrock is within a depth of 40 inches.

*Erosion by water.*—The surface K factor multiplied by the upper slope limit is more than 2 (same as prime farmland criteria).

*Excessive permeability.*—The upper limit of the permeability range is 6 inches or more within the soil profile.

*Flooding.*—The component of the map unit is occasionally flooded or frequently flooded.

*Lime content.*—The surface layer has a calcium carbonate equivalent of more than 5 percent or has a wind erodibility group of 4L.

*Limited available water capacity.*—The available water capacity calculated to a depth of 60 inches or to a root-limiting layer is 6 inches or less.

*Ponding.*—A ponding duration is assigned to the component of the map unit.

*Potential for ground-water pollution.*—The soil has a water table within a depth of 4 feet or bedrock within 40 inches of the surface, or permeability is more than 2 inches per hour within the soil profile.

*Poor tilth.*—The component of the map unit has more than 35 percent clay in the surface layer.

*Restricted permeability.*—Permeability is 0.06 inch per hour or less within the soil profile.

*Salt content.*—The component of the map unit has an electrical conductivity of more than 4 in the surface layer or more than 8 within a depth of 30 inches.

*Slope.*—The upper slope limit of the component of the map unit is more than 8 percent.

*Sodium content.*—The sodium adsorption ratio of the component of the map unit is more than 13 within a depth of 30 inches.

*Soil blowing.*—The wind erodibility index is equal to or greater than 8.

*Surface crusting.*—The organic matter content is less than 2 percent in the surface layer.

*Surface stones.*—The terms describing the texture of the surface layer include any stony or bouldery modifier, or the map unit is a stony or bouldery phase.

*Water table.*—The component of the map unit has a water table within a depth of 3 feet.

Table 7.--Cropland Limitations and Hazards

[See text for a description of the limitations and hazards listed in this table]

Map symbol and component name	Cropland limitations and hazards
AbbA: Abbie-----	Soil blowing Potential for ground-water pollution
AbbB: Abbie-----	Soil blowing Potential for ground-water pollution
AbbB2: Abbie-----	Soil blowing Potential for ground-water pollution
AbbC: Abbie-----	Soil blowing Potential for ground-water pollution
AbbC2: Abbie-----	Soil blowing Potential for ground-water pollution
AbsB: Abilene-----	None
AclA: Abbie-----	None
AflB: Abbie-----	Soil blowing Potential for ground-water pollution
AflC: Abbie-----	Soil blowing Potential for ground-water pollution
BdaB: Berda-----	Soil blowing Surface crusting Lime content
BdaC: Berda-----	Soil blowing Surface crusting Lime content
BdaD: Berda-----	Soil blowing Erosion by water Surface crusting Lime content
CRVE: Cottonwood-----	Soil blowing Erosion by water Depth to rock Excessive permeability Potential for ground-water pollution Limited available water capacity Slope Surface crusting Lime content

Table 7.--Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
CRVE: Rock outcrop-----	Non-soil material
Vinson-----	Soil blowing Depth to rock Restricted permeability Lime content
DAM: Dam-----	Non-soil material
DevE: Devol-----	Soil blowing Erosion by water Potential for ground-water pollution Slope
DpwB: Deepwood-----	Lime content
DpwC: Deepwood-----	Lime content
DpwD: Deepwood-----	Erosion by water
DpwE: Deepwood-----	Erosion by water Slope Lime content
DvlB: Devol-----	Soil blowing Potential for ground-water pollution Surface crusting
DvlC: Devol-----	Soil blowing Potential for ground-water pollution Surface crusting
DvlD: Devol-----	Soil blowing Potential for ground-water pollution Surface crusting
EdlC: Eda-----	Soil blowing Excessive permeability Potential for ground-water pollution
EdlE: Eda-----	Soil blowing Excessive permeability Potential for ground-water pollution Slope
FayB: Farry-----	Soil blowing Excessive permeability Potential for ground-water pollution

Table 7.--Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
FayC: Farry-----	Soil blowing Potential for ground-water pollution
FoFE: Fortyone-----	Soil blowing Erosion by water Excessive permeability Potential for ground-water pollution Slope
Farry-----	Soil blowing Erosion by water Excessive permeability Potential for ground-water pollution Slope
FrkA: Frankirk-----	None
FrkB: Frankirk-----	None
FtnB: Fortyone-----	Soil blowing Excessive permeability Potential for ground-water pollution
FtnC: Fortyone-----	Soil blowing Excessive permeability Potential for ground-water pollution
FtnD: Fortyone-----	Soil blowing Excessive permeability Potential for ground-water pollution
GDGE: Grandfield-----	Soil blowing Potential for ground-water pollution Surface crusting
Devol-----	Soil blowing Erosion by water Potential for ground-water pollution Slope Surface crusting
Grandmore-----	Soil blowing Potential for ground-water pollution Surface crusting
GcsA: Gracemore-----	Soil blowing Excessive permeability Potential for ground-water pollution Water table Surface crusting



Table 7.--Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
GdfB: Grandfield-----	Soil blowing Potential for ground-water pollution Surface crusting
GdfC: Grandfield-----	Soil blowing Potential for ground-water pollution Surface crusting
GdmB: Grandmore-----	Soil blowing Potential for ground-water pollution Surface crusting
GfsA: Gracemore-----	Soil blowing Flooding Excessive permeability Salt content Potential for ground-water pollution Water table Surface crusting Lime content
GmrA: Gracemont-----	Soil blowing Potential for ground-water pollution Water table Surface crusting Lime content
GmsA: Gracemont-----	Soil blowing Salt content Potential for ground-water pollution Water table Surface crusting Lime content
GrmA: Gracemore-----	Soil blowing Excessive permeability Salt content Potential for ground-water pollution Water table Surface crusting Lime content
HdGB: Hardeman-----	Soil blowing Potential for ground-water pollution
Grandmore-----	Soil blowing Potential for ground-water pollution Surface crusting
HdGC: Hardeman-----	Soil blowing Potential for ground-water pollution Surface crusting

Table 7.--Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
HdGC: Grandmore-----	Soil blowing Potential for ground-water pollution Surface crusting
HdmB: Hardeman-----	Soil blowing Potential for ground-water pollution Surface crusting
HdmC: Hardeman-----	Soil blowing Potential for ground-water pollution Surface crusting
IreA: Irene-----	None
IreB: Irene-----	None
IreC: Irene-----	None
IreD: Irene-----	Erosion by water
JssF: Jester-----	Soil blowing Excessive permeability Potential for ground-water pollution Limited available water capacity Slope
JstC: Jester-----	Soil blowing Excessive permeability Potential for ground-water pollution Limited available water capacity
KiHE: Kingsdown-----	Soil blowing Potential for ground-water pollution
Hardeman-----	Soil blowing Erosion by water Potential for ground-water pollution Slope Surface crusting Lime content
KidB: Kingsdown-----	Soil blowing Potential for ground-water pollution
LReE: Laverne-----	Soil blowing Erosion by water Limited available water capacity Slope Lime content
Rock outcrop-----	Non-soil material

Table 7.--Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
LgtA: Lugert-----	Flooding
LiJC: Lincoln-----	Soil blowing Excessive permeability Potential for ground-water pollution Limited available water capacity Surface crusting
Jester-----	Soil blowing Excessive permeability Potential for ground-water pollution Limited available water capacity
LikB: Likes-----	Soil blowing Excessive permeability Potential for ground-water pollution Limited available water capacity Surface crusting Lime content
LisA: Lincoln-----	Soil blowing Flooding Excessive permeability Potential for ground-water pollution Limited available water capacity
LncA: Lincoln-----	Soil blowing Excessive permeability Potential for ground-water pollution Limited available water capacity Surface crusting Lime content
LshA: Lesho-----	Soil blowing Excessive permeability Potential for ground-water pollution Water table Lime content
LsoA: Lincoln-----	Soil blowing Flooding Excessive permeability Potential for ground-water pollution Limited available water capacity
M-W: Water-----	Non-soil material
MLBB: Mobeetie-----	Soil blowing Potential for ground-water pollution Surface crusting Lime content

Table 7.--Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
<b>MLBB:</b>	
Likes-----	Soil blowing Excessive permeability Potential for ground-water pollution Limited available water capacity Lime content
Berda-----	Soil blowing Potential for ground-water pollution Surface crusting Lime content
<b>MLBC:</b>	
Mobeetie-----	Soil blowing Potential for ground-water pollution Surface crusting Lime content
Likes-----	Soil blowing Excessive permeability Potential for ground-water pollution Limited available water capacity Surface crusting Lime content
Berda-----	Soil blowing Potential for ground-water pollution Surface crusting Lime content
<b>MLBE:</b>	
Mobeetie-----	Soil blowing Erosion by water Potential for ground-water pollution Slope Surface crusting Lime content
Likes-----	Soil blowing Excessive permeability Potential for ground-water pollution Limited available water capacity Slope Surface crusting Lime content
Berda-----	Soil blowing Erosion by water Potential for ground-water pollution Slope Surface crusting Lime content
<b>MnsB:</b>	
Mansic-----	Soil blowing Lime content
<b>MnsC:</b>	
Mansic-----	Soil blowing Lime content

Table 7.--Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
MsnB: Manson-----	Soil blowing Surface crusting Lime content
MsnC: Manson-----	Soil blowing Surface crusting Lime content
MsnC2: Manson-----	Soil blowing Surface crusting Lime content
OMBE: Oklark-----	Soil blowing Erosion by water Potential for ground-water pollution Slope Lime content
Mansic-----	Erosion by water Potential for ground-water pollution Slope Lime content
Berda-----	Soil blowing Erosion by water Slope Lime content
OMBG: Oklark-----	Soil blowing Erosion by water Potential for ground-water pollution Slope Lime content
Mansic-----	Soil blowing Erosion by water Potential for ground-water pollution Slope Lime content
Berda-----	Soil blowing Erosion by water Slope Surface crusting Lime content
PIT: Pits-----	Non-soil material
PdoA: Paloduro-----	Soil blowing Lime content
PdoB: Paloduro-----	Soil blowing Lime content

Table 7.--Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
PdoC2: Paloduro-----	Soil blowing Lime content
PlmB: Plemons-----	Soil blowing Surface crusting Lime content
PlmC: Plemons-----	Soil blowing Surface crusting Lime content
PlmD: Plemons-----	Soil blowing Erosion by water Surface crusting Lime content
QRWG: Quinlan-----	Soil blowing Erosion by water Depth to rock Potential for ground-water pollution Limited available water capacity Slope Surface crusting Lime content
Rock outcrop-----	Non-soil material
Woodward-----	Soil blowing Erosion by water Depth to rock Limited available water capacity Slope Lime content
QRYG: Quinlan-----	Soil blowing Erosion by water Depth to rock Potential for ground-water pollution Limited available water capacity Slope Surface crusting Lime content
Rock outcrop-----	Non-soil material
Yomont-----	Soil blowing Flooding Potential for ground-water pollution Surface crusting Lime content

Table 7.--Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
QWDE:	
Quinlan-----	Soil blowing Erosion by water Depth to rock Potential for ground-water pollution Limited available water capacity Slope Surface crusting Lime content
Woodward-----	Soil blowing Erosion by water Depth to rock Limited available water capacity Slope Surface crusting Lime content
Deepwood-----	Soil blowing Erosion by water Slope Surface crusting
QWRC:	
Quinlan-----	Soil blowing Depth to rock Potential for ground-water pollution Limited available water capacity Surface crusting Lime content
Woodward-----	Soil blowing Depth to rock Surface crusting Lime content
Rock outcrop-----	Non-soil material
QnWC3:	
Quinlan-----	Soil blowing Depth to rock Potential for ground-water pollution Limited available water capacity Surface crusting Lime content
Woodward-----	Soil blowing Depth to rock Lime content
QnWD:	
Quinlan-----	Soil blowing Erosion by water Depth to rock Potential for ground-water pollution Limited available water capacity Surface crusting Lime content



Table 7.--Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
QnWD: Woodward-----	Soil blowing Erosion by water Depth to rock Limited available water capacity Surface crusting Lime content
QnWE: Quinlan-----	Soil blowing Erosion by water Depth to rock Potential for ground-water pollution Limited available water capacity Slope Surface crusting Lime content
Woodward-----	Soil blowing Erosion by water Depth to rock Limited available water capacity Slope Surface crusting Lime content
RoCH: Rock outcrop-----	Non-soil material
Cottonwood-----	Soil blowing Erosion by water Depth to rock Excessive permeability Potential for ground-water pollution Limited available water capacity Slope Surface crusting Lime content
RssA: Rosston-----	Ponding Restricted permeability Potential for ground-water pollution Water table Surface crusting Poor tilth
SAL: Salt flats-----	Non-soil material
SelA: Selman-----	None
SelB: Selman-----	None
SelC: Selman-----	None
SelC2: Selman-----	None

Table 7.--Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
SelD: Selman-----	Erosion by water
SelD2: Selman-----	Erosion by water Lime content
SprA: Spur-----	Soil blowing Lime content
SpsA: Spur-----	Soil blowing Salt content Surface crusting Lime content
StpA: St. Paul-----	None
StpB: St. Paul-----	None
StpC: St. Paul-----	None
StpD: St. Paul-----	Erosion by water
TRQC: Talpa-----	Soil blowing Depth to rock Potential for ground-water pollution Limited available water capacity Lime content
Rock outcrop-----	Non-soil material
Quinlan-----	Soil blowing Depth to rock Potential for ground-water pollution Limited available water capacity Surface crusting Lime content
TeWE: Teagard-----	Soil blowing Erosion by water Depth to rock Restricted permeability Slope Lime content Poor tilth
Wellsford-----	Soil blowing Erosion by water Depth to rock Restricted permeability Limited available water capacity Slope Surface crusting Lime content Poor tilth

Table 7.--Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
TexA: Texroy-----	None
TexB: Texroy-----	None
TexC: Texroy-----	None
TipA: Tipton-----	None
TipB: Tipton-----	None
TipC: Tipton-----	None
TipD: Tipton-----	Erosion by water
Tv1C: Tivoli-----	Soil blowing Excessive permeability Potential for ground-water pollution Limited available water capacity
Tv1E: Tivoli-----	Soil blowing Excessive permeability Potential for ground-water pollution Limited available water capacity Slope
Tv1G: Tivoli-----	Soil blowing Erosion by water Excessive permeability Potential for ground-water pollution Limited available water capacity Slope
VerB: Vernon-----	Soil blowing Depth to rock Restricted permeability Sodium content Limited available water capacity Surface crusting Lime content Poor tilth
VerC: Vernon-----	Soil blowing Erosion by water Depth to rock Restricted permeability Sodium content Limited available water capacity Surface crusting Lime content Poor tilth

Table 7.--Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
VerD: Vernon-----	Soil blowing Erosion by water Depth to rock Restricted permeability Sodium content Limited available water capacity Surface crusting Lime content Poor tilth
VrrB: Vernon-----	Soil blowing Depth to rock Restricted permeability Potential for ground-water pollution Lime content Poor tilth
VrrC: Vernon-----	Soil blowing Depth to rock Restricted permeability Potential for ground-water pollution Limited available water capacity
W: Water-----	Non-soil material
WQHE: Westola-----	Flooding Potential for ground-water pollution Surface crusting
Quinlan-----	Soil blowing Erosion by water Depth to rock Potential for ground-water pollution Limited available water capacity Slope Surface crusting Lime content
Hardeman-----	Erosion by water Potential for ground-water pollution Slope Surface crusting
WQnB: Woodward-----	Soil blowing Depth to rock Limited available water capacity Lime content
Quinlan-----	Soil blowing Depth to rock Potential for ground-water pollution Limited available water capacity Surface crusting Lime content

Table 7.--Cropland Limitations and Hazards--Continued

Map symbol and component name	Cropland limitations and hazards
WQnC: Woodward-----	Soil blowing Depth to rock Lime content
Quinlan-----	Soil blowing Depth to rock Potential for ground-water pollution Limited available water capacity Surface crusting Lime content
WodA: Woods-----	Soil blowing Restricted permeability Poor tilth
WodB: Woods-----	Soil blowing Restricted permeability Poor tilth
WodC: Woods-----	Soil blowing Erosion by water Restricted permeability Poor tilth
WslA: Westola-----	Soil blowing Flooding Potential for ground-water pollution Surface crusting Lime content
WstA: Westola-----	Soil blowing Potential for ground-water pollution Surface crusting
YmrA: Yomont-----	Soil blowing Potential for ground-water pollution Surface crusting Lime content
YmtA: Yomont-----	Soil blowing Flooding Potential for ground-water pollution Surface crusting Lime content

## Prime Farmland

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, State, and Federal levels, as well as individuals, must encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to food, feed, forage, fiber, and oilseed crops. Such soils have properties that favor the economic production of sustained high yields of crops. The soils need only to be treated and managed by acceptable farming methods. An adequate moisture supply and a sufficiently long growing season are required. Prime farmland soils produce the highest yields with minimal expenditure of energy and economic resources, and farming these soils results in the least damage to the environment.

Prime farmland soils may presently be used as cropland, pasture, rangeland, or woodland or for other purposes. They either are used for food and fiber or are available for these uses. Urban or built-up land, public land, and water areas cannot be considered prime farmland. Urban or built-up land is any contiguous unit of land 10 acres or more in size that is used for such purposes as housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf courses, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water-control structures. Public land is land not available for farming in National forests, National parks, military reservations, and State parks.

Prime farmland soils commonly receive an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable, and the level of acidity or alkalinity and the content of salts and sodium are acceptable. The soils have few, if any, rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods, and they are not frequently flooded during the growing season or are protected from flooding. Slopes range from 0 to 8 percent.

Soils that have a high water table, are subject to flooding, or are droughty may qualify as prime farmland where these limitations are overcome by drainage measures, flood control, or irrigation. Onsite evaluation is necessary to determine the effectiveness of corrective measures. More information about the criteria for prime farmland can be obtained at the local office of the Natural Resources Conservation Service.

A recent trend in land use has been the conversion of prime farmland to urban and industrial uses. The loss of prime farmland to other uses puts pressure on lands that are less productive than prime farmland.

About 237,000 acres, or about 36 percent of the survey area, meets the requirements for prime farmland. The map units in the survey area that meet the requirements for prime farmland are listed in table 8, "Prime Farmland." The location of each map unit is shown on the detailed soil maps. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

Table 8.--Prime Farmland

[Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland]

Map symbol	Soil name
AbbA	Abbie loam, 0 to 1 percent slopes
AbbB	Abbie loam, 1 to 3 percent slopes
AbbC	Abbie loam, 3 to 5 percent slopes
AbsB	Abilene silt loam, 1 to 3 percent slopes
AclA	Abbie clay loam, 0 to 1 percent slopes
AflB	Abbie fine sandy loam, 1 to 3 percent slopes
AflC	Abbie fine sandy loam, 3 to 5 percent slopes
BdaB	Berda loam, 1 to 3 percent slopes
BdaC	Berda loam, 3 to 5 percent slopes
DpwB	Deepwood loam, 1 to 3 percent slopes
DpwC	Deepwood loam, 3 to 5 percent slopes
FayB	Farry fine sandy loam, 1 to 3 percent slopes
FayC	Farry fine sandy loam, 3 to 5 percent slopes
FrkA	Frankirk silt loam, 0 to 1 percent slopes
FrkB	Frankirk silt loam, 1 to 3 percent slopes
FtnB	Fortyone sandy loam, 1 to 3 percent slopes
FtnC	Fortyone sandy loam, 3 to 5 percent slopes
FtnD	Fortyone sandy loam, 5 to 8 percent slopes
GdfB	Grandfield fine sandy loam, 1 to 3 percent slopes
GdfC	Grandfield fine sandy loam, 3 to 5 percent slopes
GdmB	Grandmore fine sandy loam, 1 to 3 percent slopes
HdGB	Hardeman-Grandmore complex, 1 to 3 percent slopes
HdGC	Hardeman-Grandmore complex, 3 to 5 percent slopes
HdmB	Hardeman fine sandy loam, 1 to 3 percent slopes
HdmC	Hardeman fine sandy loam, 3 to 5 percent slopes
IreA	Irene silt loam, 0 to 1 percent slopes
IreB	Irene silt loam, 1 to 3 percent slopes
IreC	Irene silt loam, 3 to 5 percent slopes
KidB	Kingsdown fine sandy loam, 1 to 3 percent slopes
LgtA	Lugert silt loam, 0 to 1 percent slopes, occasionally flooded
LshA	Lesho clay loam, 0 to 1 percent slopes, rarely flooded
MLBB	Mobeetie-Likes-Berda complex, 1 to 3 percent slopes
MLBC	Mobeetie-Likes-Berda complex, 3 to 5 percent slopes
MnsB	Mansic clay loam, 1 to 3 percent slopes
MnsC	Mansic clay loam, 3 to 5 percent slopes
MsnB	Manson loam, 1 to 3 percent slopes
MsnC	Manson loam, 3 to 5 percent slopes
PdoA	Paloduro clay loam, 0 to 1 percent slopes
PdoB	Paloduro clay loam, 1 to 3 percent slopes
PlmB	Plemons loam, 1 to 3 percent slopes
PlmC	Plemons loam, 3 to 5 percent slopes
SelA	Selman silt loam, 0 to 1 percent slopes
SelB	Selman silt loam, 1 to 3 percent slopes
SelC	Selman silt loam, 3 to 5 percent slopes
SprA	Spur loam, 0 to 1 percent slopes, rarely flooded
StpA	St. Paul silt loam, 0 to 1 percent slopes
StpB	St. Paul silt loam, 1 to 3 percent slopes
StpC	St. Paul silt loam, 3 to 5 percent slopes
TexA	Texroy loam, 0 to 1 percent slopes
TexB	Texroy loam, 1 to 3 percent slopes
TexC	Texroy loam, 3 to 5 percent slopes
TipA	Tipton loam, 0 to 1 percent slopes
TipB	Tipton loam, 1 to 3 percent slopes
TipC	Tipton loam, 3 to 5 percent slopes
VrrB	Vernon sandy loam, 1 to 3 percent slopes, overblown
VrrC	Vernon sandy loam, 3 to 5 percent slopes, overblown
WodA	Woods clay loam, 0 to 1 percent slopes
WodB	Woods clay loam, 1 to 3 percent slopes



Table 8.--Prime Farmland--Continued

Map symbol	Soil name
WslA	Westola fine sandy loam, 0 to 1 percent slopes, occasionally flooded
WstA	Westola fine sandy loam, 0 to 1 percent slopes, rarely flooded
YmrA	Yomont loam, 0 to 1 percent slopes, rarely flooded
YmtA	Yomont loam, 0 to 1 percent slopes, occasionally flooded

## Rangeland

Mark Moseley, range conservationist, Natural Resources Conservation Service, Stillwater, Oklahoma, helped prepare this section.

Range and native pasture provide forage for livestock in the survey area.

*Range* is defined as land on which the native vegetation (the climax, or natural potential, plant community) is predominantly grasses, grasslike plants, forbs, and shrubs suitable for grazing and browsing. Range includes natural grasslands, savannas, many wetlands, some deserts, tundra, and certain shrub and forb communities. Range receives no regular or frequent cultural treatment. The composition and production of the plant community are determined by soil, climate, topography, overstory canopy, and grazing management.

*Native pasture* is defined as land on which the potential (climax) vegetation is forest but which is used and managed primarily for the production of native forage plants. Native pasture includes cutover forestland and forestland that has been cleared and is managed for native or naturalized forage plants.

Range makes up about 66 percent of the land in Harper County. There has been a recent trend to reseed many areas of marginal cropland with a mixture of native grass species. The range is used primarily for grazing by domestic cattle; however, its importance as wildlife habitat is becoming increasingly important as more landowners lease the hunting rights on their range as an additional source of income.

The rangeland in Harper County originally produced a wide variety of tall and mid-sized grasses interspersed with an abundance of forbs that evolved under the collective influence of ungulate grazing, fire, variable climatic events, insects, and rodents and other wildlife. Effective range management practices that mimic the historical management can help to maintain or re-establish these high quality plants.

Four types of rangeland exist in Harper County. The first type is in the western part of the county where the soils formed in very deep, loamy, alluvial sediments. This area is typified by broad flats and gently sloping to sloping uplands. The soils support predominantly tall grasses, and potential productivity is high. The second type is in the southern and northwestern parts of the county along areas parallel to the Beaver and Cimarron Rivers. In these areas the soils formed in deep, sandy and loamy sediments. Hummocky sand dunes and flat depressions typify these areas, and wind erosion is a hazard if adequate cover is not maintained on the surface of the soil. Soils in these areas support tall and mid grasses with scattered woody shrubs, and potential productivity is moderate. The third type is in the north-central and central parts of the county. The soils are loamy and are shallow to very deep over sandstone or alluvial sediment. These areas are typified by rolling hills and a few flat-topped ridges and canyons. The soils support a mixture of tall, mid, and short grasses, and potential productivity is moderate to high. The fourth type is in the east-central part of the county where the soils are loamy or clayey and are shallow to moderately deep over gypsum or shale. This area is typified by steep escarpments and gently sloping to sloping uplands. The soils support short and mid grasses. Potential productivity is low because of the shallow root zones.

Approximately 75 percent of the annual production of forage occurs from April through July following the rains in spring and early summer. A second, smaller growth period may occur in the fall if sufficient moisture is available.

Table 9, "Rangeland Productivity and Characteristic Plant Communities," shows for each soil the ecological site; the total annual production of vegetation in favorable, normal, and unfavorable years; the characteristic vegetation; and the average percentage of each species. Only those soils that are used as rangeland or are suited to use as rangeland are listed. Explanation of the column headings in this table follows.

An *ecological site* for rangeland is a distinctive kind of land and vegetation with

specific physical characteristics that make it different from other kinds of land in its ability to produce a distinctive kind and amount of vegetation.

Many different ecological sites are in the survey area. Over time, the combination of plants best suited to a particular soil and climate has become dominant. If the soil is not excessively disturbed, this group of plants is the natural plant community for the site. Natural plant communities are not static but vary slightly from year to year and place to place.

The relationship between soils and vegetation was ascertained during this survey; thus, ecological sites generally can be determined directly from the soil map. Soil properties that affect moisture supply and plant nutrients have the greatest influence on the productivity of range plants. Soil reaction, salt content, and a seasonal high water table are also important. The "Field Office Technical Guide," which is available at the local office of the Natural Resources Conservation Service, can provide specific information about ecological sites.

*Total dry-weight production* is the amount of vegetation that can be expected to grow annually on well-managed range that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruit of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperature make growing conditions substantially better than average. In a normal year, growing conditions are near the historical monthly average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Figure 18 shows a typical growth curve that represents the percentage of total growth that occurs each month for native vegetation and other forage. Yields are adjusted to a common percent of air-dry moisture content. The relationship of green weight to air-dry weight varies according to such factors as stage of maturity, exposure, amount of shade, recent rains, and unseasonable dry periods.

*Characteristic vegetation* consists of the grasses, forbs, and shrubs that make up most of the potential natural plant community on each soil. The plants are listed by common name. *Rangeland composition* lists the anticipated percentage of the total annual production for each species making up the characteristic vegetation. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season.

## Similarity Index

The similarity index indicates on a percentage basis the extent to which the present plant community resembles a specified vegetative state on an ecological site. NRCS uses similarity index two ways.

The first use compares the present vegetation on an ecological site to the presumed historic vegetation for that site. A similarity index of 70 would suggest that the present plant community contains 70 percent of the presumed historic plant community for that site. This comparison provides a basis for examining the extent and direction of changes that have taken place between current vegetation and historic vegetation.

The second use measures how near the current plant community is to the landowners goal for the land. The management goal for rangeland is not necessarily a similarity index of 100 as compared to the historic plant community. Therefore, the similarity index can represent the percentage of the plant community that resembles a desired plant community.

Abnormal disturbances that can change the natural plant community include

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
IMPROVED BERMUDAGRASS				5	25	35	20	10	5			
WEeping LOVEGRASS			3	20	25	20	15	6	11			
INTRODUCED BLUESTEM				3	15	26	22	18	10	1		
SMALL GRAIN GRAZEOUT	3	9	29	27	18				1	4	6	3
FORAGE SORGHUM						14	33	33	20			
NATIVE GRASS	1	1	2	10	20	27	16	8	5	2	2	1

Figure 18.—Typical growth curves for various kinds of forage in Harper County. The growth curve for each kind of forage indicates the percentage of the total annual growth that occurs each month.

repeated overuse by livestock, excessive burning, erosion, and cultivation. Grazing animals select the most palatable plants. These plants eventually die if they are continually grazed at a severity that does not allow for recovery. A very severe disturbance can completely destroy the natural community. Under such conditions, the abundance of less desirable plants, such as annuals and weed-like plants, can increase. If the plant community and the soils have not deteriorated significantly and proper range management is applied, the site eventually can return to predominantly natural plants.

Knowledge of the ecological site is necessary as a basis for planning and applying the management needed to maintain or improve the desired plant community for selected uses. Such information is needed to support management objectives, planned grazing systems, stocking rates, and wildlife management practices; to improve the potential of an area for recreational uses; and to improve the condition of watersheds.

## Rangeland Management

Rangeland management requires knowledge of the kind of soils and of the potential natural plant community. It also requires an evaluation of the similarity index.

Effective range management conserves rainfall, enhances water quality, reduces the hazard of downstream flooding, improves yields, provides forage for livestock and wildlife, enhances recreational opportunities, and protects the soil. The main management concern is recognizing important changes in the plant cover or the range trend. These changes take place gradually and can be overlooked.

Each range manager should evaluate the type of plant community that best supports the ranch and then apply management and ecological principles to achieve the goals. The desired plant community should be within the capabilities of the land.

The range management practices used in Harper County include proper grazing

use, deferred grazing, and planned grazing systems. They also include properly located stock-water developments and fences and a planned distribution of salt and feed. If undesirable plants become dominant, range seeding, brush management, or prescribed burning should be considered.

A pasture program is needed to provide the desired amount of forage during each month of the year. A study of the growth habits of the different plants is necessary to ensure adequate forage during each month. The months that various kinds of forage plants grow are indicated in figure 18. The percent growth that can be safely grazed each month without substantially reducing the total yield for each kind of plant is illustrated.

Range management includes four major considerations:

- *Grazing distribution*, which is achieved by managing livestock to graze all parts of the grazing unit equally.
- *Selective grazing*, which occurs because animals graze preferred plants to balance their diets. If selective grazing occurs repeatedly, the preferred plants are damaged.
- *Proper stocking rates*, which are achieved by balancing animal numbers with forage production.
- *Rest periods*, during which grazed plants are given enough rest to recover and to maintain growth.

It is important to remember that forage production is controlled by rainfall while composition is determined by grazing management.

The setting of stocking rates is not an exact science because there are influences from grazing management, season of use, mix of livestock, and seasonal forage production. Some general rules, however, can be helpful. To maintain a nutritional cover of plants, about 50 percent of the annual growth of the most important grazing plants should remain at the end of the grazing season. Plants can be removed not only through grazing by livestock but also through grazing by rodents, insects, and wildlife and through deterioration caused by climatic variations. Because of these factors, a safe initial stocking rate should be calculated on the basis of 25 percent of the total annual growth, by weight, of the vegetation.

For example, production could be 2,800 pounds of air-dry grasses, forbs, and woody species for an average season on a Loamy Prairie ecological site with a similarity index above 70 to the historic plant community. Twenty-five percent of this production would be 700 pounds.

A 1,000-pound cow and her calf is equivalent to one animal unit (AU) and consume about 2.6 percent of her body weight (26 pounds) of forage per day. Therefore, in 1 month an animal unit would consume 790 pounds of native vegetation, depending on the quality and stage of growth of the plants (26 pounds per day times 365 days per year divided by 12 months per year).

Dividing 700 pounds (the forage allocation) by 26 pounds (the forage required per day for 1 animal unit) suggests that 1 acre of Loamy Prairie ecological site with a similarity index of 70 would feed one cow and calf for 27 days. To convert forage available from 1 acre to animal unit months (AUM), the available forage (700 pounds) is divided by the amount required to feed 1 animal unit for 1 month (790 pounds). One acre would provide 0.88 AUM of grazing. Therefore, 14 acres would feed one cow and calf for 12 months.

Another approach is to calculate the annual forage needs of an animal unit (790 pounds times 12 months equals 9,480 pounds). Dividing the 700 pounds of usable forage per acre into the 9,480 pounds needed by the cow and calf reveals that approximately 14 acres would be needed for one cow and calf annually. Stocking rate calculations should be adjusted for animal size, grazing system, and grazing season.

More information about planning a grazing program is available from the local office of the Natural Resources Conservation Service.

## Ecological Site Descriptions

Twenty-eight ecological sites are recognized in Harper County. The following descriptions include a list of the plants that are characteristic of the sites. The soils are also indicated for many of the sites. Detailed ecological site descriptions are available at the local office of the Natural Resources Conservation Service.

**R077EY014OK, Deep Sand PE 30–40.**—This site is in areas of deep, sandy soils on uplands. It has gently rolling or low dune topography. Under good management, the predominant grasses are sand bluestem, little bluestem, needle and thread grass, and sideoats grama. Short grasses, sand dropseed, annual grasses, yucca, sand sagebrush, and other woody plants increase in abundance under continuous heavy use.

**R077EY040OK, Hardland PE 30–40.**—This site is in areas of level to moderately sloping, very deep soils on uplands. These soils have slow intake of water, especially when the natural cover is disturbed by grazing and drought. The natural vegetation is a mixture of blue grama, buffalograss, western wheatgrass, vine mesquite, sideoats grama, and threeawn. Heavy use leads to the elimination of mid grasses and an increase in abundance of buffalograss and weeds.

**R077EY048OK, Limy Upland PE 30–40.**—This site is in areas of loamy, calcareous soils on uplands. The most important grasses are little bluestem and sideoats grama. Blue grama, buffalograss, and hairy grama tend to take over following continuous heavy use. Red threeawn, broom snakeweed, and hairy tridens are common invader species. Decreasers make up about 30 percent of the cover when the site is in top condition. A great variety of forbs from the historic plant community are native to this site and make up a considerable part of the production.

**R077EY049OK, Limy Sandy Plains PE 30–40.**—This site is in upland areas where deep, moderately sandy soils are underlain by caliche at varying depths. Under good management, this site produces a good cover of sand bluestem, little bluestem, and forbs. Under continuous heavy use, mid and tall grasses are replaced by sideoats grama, threeawn, short grasses, and annual grasses.

**R077EY056OK, Loamy Prairie PE 30–40.**—This site is in areas where the historic plant community plants includes little bluestem, sand bluestem, switchgrass, and Indiangrass with an understory of sideoats grama, western wheatgrass, blue grama, and buffalograss. Legumes of importance are leadplant, Illinois bundleflower, and scurfpea. Forbs from the historic plant community include Maximilian sunflower, Louisiana sagewort, and heath aster. Invading grasses are sand dropseed, windmill grass, and silver bluestem. Invading woody plants are sand sagebrush, skunkbush, hackberry, and coralberry.

**R077EY098OK, Depressional Upland PE 30–40.**—This site is in areas where, depending on degree of inundation, the dominant plants are western wheatgrass, vine mesquite, buffalograss, blue grama, knotroot bristlegrass, pond weed, or other forbs and sedges.

**R077EY848OK, Reseeded Limy Upland PE 30–40.**—This site is in formerly cultivated areas of eroded, calcareous, sandy soils that have inherent low fertility. Species in the reseeding mix typically included sideoats grama, buffalograss, and blue grama. Also included in lesser amounts were sand lovegrass, little bluestem, sand bluestem, switchgrass, and Indiangrass. Abusive grazing converts the stand to short grasses.

**R077XY082OK, Shallow PE 22–28.**—This site is on uplands in areas of nearly level to steeply sloping, loamy soils that are underlain at shallow depths by caliche and bedrock. Under good management, this site produces a good cover of sideoats grama with some little bluestem and hairy grama. Under continued heavy use, these grasses give way to unpalatable weeds and threeawn grasses.



**R078CY047OK, Loamy Saline Bottomland PE 34–44.**—This site is on flood plains in areas of very deep, somewhat poorly drained, level to slightly depressional soils that have a saline subsoil. The important plants are switchgrass, knotroot bristlegass, western wheatgrass, and Canada wildrye. Continued abuse results in an increase in abundance of alkali sacaton, inland saltgrass, sideoats grama, sedges, and American licorice. Salt cedar is an invading non-native woody plant.

**R078CY074OK, Shallow Sandy Prairie PE 31–44.**—This site is in areas where the major plants include Indiangrass, big bluestem, switchgrass, and little bluestem. Deterioration of this site is revealed by an increase in abundance in the short and mid grasses, such as blue grama, sideoats grama, and sand lovegrass. Sand sagebrush and leadplant also occur on this site.

**R078XY005OK, Breaks PE 31–44.**—This site is on uplands in areas of steep, shallow, loamy soils that have low production. This site is on bluffs or escarpments with excessive drainage. The important plants are big bluestem, little bluestem, Indiangrass, Canada wildrye, and prairie clover. Prolonged abuse results in an increase in abundance of sideoats grama, blue grama, buffalograss, and skunkbush.

**R078XY014OK, Deep Sand PE 31–44.**—This site is in areas where the historic plant community cover is principally little bluestem and sand bluestem. These species represent approximately 40 to 50 percent of the vegetation. Switchgrass and Indiangrass are also common to the site. Other common plants include blue grama, sand lovegrass, sand dropseed, fall witchgrass, and Texas bluegrass. Sand flatsedge is an important grasslike species. Woody species include sand sagebrush and skunkbush.

**R078XY022OK, Dune PE 31–44.**—This site is in areas that support a mixture of decreaser grasses, such as sand bluestem, little bluestem, giant sandreed, and switchgrass. These grasses make up 60 percent of the vegetation. Dominant increaser grasses include blue grama, sand dropseed, and sand paspalum. Principal woody plants are sand sagebrush and skunkbush. Invaders are red lovegrass, purple threeawn, red threeawn, and annual wild buckwheat. The first plants to stabilize active blowouts or dunes are scurfpea, blowout grass, and giant sandreed.

**R078XY031OK, Clay Prairie (South) PE 31–44.**—This site is in areas where the dominant plant is little bluestem. Sideoats grama is secondary. Other important plants include hairy grama and rough tridens. Mesquite and cactus are invaders.

**R078XY038OK, Gyp PE 31–44.**—This site is in areas where the dominant grass is little bluestem. Other important grasses are blue grama, sideoats grama, rough tridens, hairy tridens, and sand dropseed. This site usually supports a high percent of forbs, mainly hairy false goldenaster and false broomweed.

**R078XY041OK, Hardland (North) PE 31–44.**—This site is in areas where the dominant cover has a mixed-grass aspect consisting of sand bluestem, little bluestem, sideoats grama, blue grama, and switchgrass. Sideoats grama and blue grama make up about 50 percent of the cover. Under prolonged grazing abuse, buffalograss increases in abundance and becomes important. Western ragweed and red threeawn are common invaders.

**R078XY050OK, Loamy Bottomland PE 31–44.**—This site is in areas where sand bluestem, big bluestem, switchgrass, Indiangrass, and little bluestem are the most important species. Less common species are western wheatgrass, vine mesquite, tall dropseed, eastern gamagrass, Canada wildrye, sideoats grama, buffalograss, blue grama, and windmill grass. The dominant plants make up about 80 percent of the vegetation.

**R078XY056OK, Loamy Prairie PE 31–44.**—This site is in areas where the historic plant community includes little bluestem, sand bluestem, switchgrass, and Indiangrass with an understory of sideoats grama, western wheatgrass, and blue grama. Legumes of importance are leadplant, Illinois bundleflower, and scurfpea. The forbs from the historic plant community include Maximilian sunflower, Louisiana



sagewort, and heath aster. Other grasses include sideoats grama, buffalograss, and blue grama. Invading grasses are sand dropseed, windmill grass, and silver bluestem. Invading woody plants are sand sagebrush, skunkbush, hackberry, and coralberry.

**R078XY057OK, Loamy Prairie (Cal) PE 31–44.**—This site is in areas where the historic plant community plants includes little bluestem, sand bluestem, switchgrass, and Indiangrass with an understory of sideoats grama, western wheatgrass, blue grama, and buffalograss. Legumes of importance are leadplant, Illinois bundleflower, and scurfpea. Forbs from the historic plant community include Maximilian sunflower, Louisiana sagewort, and heath aster. Invading grasses are sand dropseed, windmill grass, and silver bluestem. Invading woody plants are sand sagebrush, skunkbush, hackberry, and coralberry.

**R078XY068OK, Sandy Bottomland PE 31–44.**—This site is in areas where sand bluestem, little bluestem, Indiangrass, and switchgrass are the principal decreaseers from the historic plant community. Also present are minor amounts of giant sandreed, tall dropseed, sideoats grama, and Canada wildrye.

**R078XY073OK, Sandy Prairie PE 31–44.**—This site is in areas where sand bluestem, little bluestem, Indiangrass, and switchgrass are the dominant grasses and compose 75 percent of the vegetation. Other plants include sideoats grama and blue grama. Sand dropseed is a common invader.

**R078XY083OK, Shallow Prairie (North) PE 31–44.**—This site is in areas where little bluestem is the principal grass from the historic plant community. Sideoats grama and hairy grama are the other principal grasses. Small amounts of sand bluestem and a variety of legumes and forbs from the historic plant community make up the remaining cover.

**R078XY095OK, Subirrigated PE 31–44.**—This site is on uplands or flood plains in areas of very deep, nearly level and very gently sloping, sandy soils that have a high water table that is beneficial to plant growth. This is a highly productive site. The important plants are switchgrass, big bluestem, Indiangrass, and eastern gamagrass. Continuous overgrazing results in an increase in abundance of tall dropseed, sideoats grama, sedges, willow, and cottonwood.

**R078XY097OK, Subirrigated (Saline) PE 31–44.**—This site is in lowlands in areas of soils that have either a clay or sandy clay substrata that maintains a high water table within reach of most grasses. The presence of salt favors the growth of the more salt-tolerant grasses, such as switchgrass, Canada wildrye, eastern gamagrass, and alkali sacaton. Continuous heavy use brings about an invasion of less desirable grasses, such as inland saltgrass, alkali muhly, and silver bluestem.

**R078XY098OK, Very Shallow PE 31–44.**—This site is in areas where the historic plant community vegetation is about 60 percent sideoats grama, hairy grama, and purple threeawn. Increaseers are buffalograss, hairy tridens, Texas grama, and annuals. Invaders are silver bluestem, sand dropseed, meadow dropseed, annual threeawn, broomweed, and western ragweed.

**R078XY100OK, Shale PE 31–44.**—This site is in areas of gently sloping to moderately steep, erosive uplands. The slopes are relatively smooth and convex with some areas dissected by drainage patterns. The natural potential vegetation of this site is a mixed-grass prairie. Big bluestem, little bluestem, and sideoats grama are the dominant forage producers. The development of vegetation was influenced by grazing and occasional wildfires. The shale parent material maintains the site in its natural state.

**R078XY856OK, Reseeded Loamy Prairie PE 31–44.**—This site is in areas where the plant cover includes little bluestem, Indiangrass, and other seeded grass species. Native legumes can be abundant. Important increaseer grasses include jointtail, meadow dropseed, tall dropseed, and hairy grama. Production is much lower than in the Loamy Prairie site due to a lower quality of soil health.

**R078XY883OK, Reseeded Shallow Prairie PE 31–44.**—This site is in areas where the reseeded plant cover is mainly little bluestem, sideoats grama, and blue grama with other grasses included. Destructive grazing results in an increase in abundance of annual forbs and grasses and western ragweed.

Table 9.--Rangeland Productivity and Characteristic Plant Communities

[Only the soils that support rangeland vegetation suitable for grazing are rated]

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
AbbA: Abbie-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2
AbbB: Abbie-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2
AbbB2: Abbie-----	Reseeded Limy Upland PE 30-40 R077EY848OK	1,900	1,300	800	---	---
AbbC: Abbie-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2
AbbC2: Abbie-----	Reseeded Limy Upland PE 30-40 R077EY848OK	1,900	1,300	800	---	---

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
AbsB: Abilene-----	Hardland (north) PE 31-44 R078XY0410K	2,000	1,500	1,000	Blue grama----- Sideoats grama----- Buffalograss----- Miscellaneous perennial grasses Western wheatgrass----- Miscellaneous perennial forbs--	35 20 15 15 10 5
AclA: Abbie-----	Limy Upland PE 30-40 R077EY0480K	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2
AflB: Abbie-----	Limy Sandy Plains PE 30- 40 R077EY0490K	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2
AflC: Abbie-----	Limy Sandy Plains PE 30- 40 R077EY0490K	2,300	1,600	1,200	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
BdaB: Berda-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2
BdaC: Berda-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2
BdaD: Berda-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
CRVE: Cottonwood-----	Gyp PE 31-44 R078XY038OK	1,800	1,200	1,000	Little bluestem----- Sideoats grama----- Blue grama----- Buffalograss----- Sand dropseed----- Gumweed----- Hairy goldenaster----- Hairy grama----- Hairy woollygrass----- Miscellaneous perennial forbs-- Juniper----- Rough tridens-----	25 20 10 10 10 5 5 5 2 5 2 1
Rock outcrop. Vinson-----	Loamy Prairie (cal) PE 31-44 R078XY057OK	3,500	2,800	2,000	Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Blue grama----- Buffalograss----- Indiangrass----- Annual grasses----- Miscellaneous perennial forbs-- Sand bluestem----- Switchgrass----- Tall dropseed-----	20 15 15 10 10 5 5 5 5 5 5
DAM: Dam.						
DevE: Devol-----	Deep Sand PE 31-44 R078XY014OK	4,000	2,800	2,000	Little bluestem----- Sand bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Indiangrass----- Sand lovegrass----- Sand sagebrush----- Switchgrass----- Miscellaneous perennial forbs--	25 20 15 10 8 5 5 5 5 2

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
DpwB: Deepwood-----	Loamy Prairie (cal) PE 31-44 R078XY057OK	3,500	2,800	2,000	Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Blue grama----- Buffalograss----- Indiangrass----- Annual grasses----- Miscellaneous perennial forbs-- Sand bluestem----- Switchgrass----- Tall dropseed-----	20 15 15 10 10 5 5 5 5 5 5
DpwC: Deepwood-----	Loamy Prairie (cal) PE 31-44 R078XY057OK	3,500	2,800	2,000	Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Blue grama----- Buffalograss----- Indiangrass----- Annual grasses----- Miscellaneous perennial forbs-- Sand bluestem----- Switchgrass----- Tall dropseed-----	20 15 15 10 10 5 5 5 5 5 5
DpwD: Deepwood-----	Loamy Prairie (cal) PE 31-44 R078XY057OK	3,500	2,800	2,000	Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Blue grama----- Buffalograss----- Indiangrass----- Annual grasses----- Miscellaneous perennial forbs-- Sand bluestem----- Switchgrass----- Tall dropseed-----	20 15 15 10 10 5 5 5 5 5 5



Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
DpwE: Deepwood-----	Loamy Prairie (cal) PE 31-44 R078XY057OK	3,500	2,800	2,000	Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Blue grama----- Buffalograss----- Indiangrass----- Annual grasses----- Miscellaneous perennial forbs-- Sand bluestem----- Switchgrass----- Tall dropseed-----	20 15 15 10 10 5 5 5 5 5 5
DvlB: Devol-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem----- Sand bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Indiangrass----- Sand lovegrass----- Sand sagebrush----- Switchgrass----- Miscellaneous perennial forbs--	25 20 15 10 8 5 5 5 5 2
DvlC: Devol-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem----- Sand bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Indiangrass----- Sand lovegrass----- Sand sagebrush----- Switchgrass----- Miscellaneous perennial forbs--	25 20 15 10 8 5 5 5 5 2

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Dv1D: Devol-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem----- Sand bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Indiangrass----- Sand lovegrass----- Sand sagebrush----- Switchgrass----- Miscellaneous perennial forbs--	25 20 15 10 8 5 5 5 5 2
Ed1C: Eda-----	Deep Sand PE 31-44 R078XY014OK	3,500	2,400	1,700	Sand bluestem----- Little bluestem----- Miscellaneous shrubs----- Switchgrass----- Indiangrass----- Blue grama----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Sand lovegrass----- Sand sagebrush----- Sideoats grama-----	25 20 10 10 5 5 5 5 5 5 5
Ed1E: Eda-----	Dune PE 31-44 R078XY022OK	3,500	2,400	1,700	Sand bluestem----- Little bluestem----- Miscellaneous shrubs----- Switchgrass----- Indiangrass----- Blue grama----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Sand lovegrass----- Sand sagebrush----- Sideoats grama-----	25 20 10 10 5 5 5 5 5 5 5

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
FayB: Farry-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem-----	25
					Sand bluestem-----	20
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial grasses	8
					Indiangrass-----	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Switchgrass-----	5
					Miscellaneous perennial forbs--	2
FayC: Farry-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem-----	25
					Sand bluestem-----	20
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial grasses	8
					Indiangrass-----	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Switchgrass-----	5
					Miscellaneous perennial forbs--	2
FoFE: Fortyone-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem-----	25
					Sand bluestem-----	20
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial grasses	8
					Indiangrass-----	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Switchgrass-----	5
					Miscellaneous perennial forbs--	2
Farry-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem-----	25
					Sand bluestem-----	20
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial grasses	8
					Indiangrass-----	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Switchgrass-----	5
					Miscellaneous perennial forbs--	2

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
FrkA: Frankirk-----	Hardland (north) PE 31-44 R078XY041OK	2,000	1,500	1,000	Blue grama----- Sideoats grama----- Buffalograss----- Miscellaneous perennial grasses Western wheatgrass----- Miscellaneous perennial forbs--	35 20 15 15 10 5
FrkB: Frankirk-----	Hardland (north) PE 31-44 R078XY041OK	2,000	1,500	1,000	Blue grama----- Sideoats grama----- Buffalograss----- Miscellaneous perennial grasses Western wheatgrass----- Miscellaneous perennial forbs--	35 20 15 15 10 5
FtnB: Fortyone-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem----- Sand bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Indiangrass----- Sand lovegrass----- Sand sagebrush----- Switchgrass----- Miscellaneous perennial forbs--	25 20 15 10 8 5 5 5 5 2
FtnC: Fortyone-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem----- Sand bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Indiangrass----- Sand lovegrass----- Sand sagebrush----- Switchgrass----- Miscellaneous perennial forbs--	25 20 15 10 8 5 5 5 5 2

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
FtnD: Fortyone-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem-----	25
					Sand bluestem-----	20
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial grasses	8
					Indiangrass-----	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Switchgrass-----	5
					Miscellaneous perennial forbs--	2
GcsA: Gracemore-----	Subirrigated PE 31-44 R078XY095OK	10,000	7,000	5,000	Switchgrass-----	25
					Indiangrass-----	10
					Alkali sacaton-----	10
					Miscellaneous perennial forbs--	10
					Alkali muhly-----	5
					Eastern gamagrass-----	5
					Inland saltgrass-----	5
					Miscellaneous perennial grasses	5
					Miscellaneous trees-----	5
					Prairie cordgrass-----	5
					Sedge-----	5
					Sunflower-----	5
					Western wheatgrass-----	5
GdfB: Grandfield-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem-----	25
					Sand bluestem-----	20
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial grasses	8
					Indiangrass-----	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Switchgrass-----	5
					Miscellaneous perennial forbs--	2

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
GdfC: Grandfield-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem-----	25
					Sand bluestem-----	20
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial grasses	8
					Indiangrass-----	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Switchgrass-----	5
					Miscellaneous perennial forbs--	2
GDGE: Grandfield-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem-----	25
					Sand bluestem-----	20
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial grasses	8
					Indiangrass-----	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Switchgrass-----	5
					Miscellaneous perennial forbs--	2
Devol-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem-----	25
					Sand bluestem-----	20
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial grasses	8
					Indiangrass-----	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Switchgrass-----	5
					Miscellaneous perennial forbs--	2
Grandmore-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem-----	25
					Sand bluestem-----	20
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial grasses	8
					Indiangrass-----	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Switchgrass-----	5
					Miscellaneous perennial forbs--	2

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
GdmB: Grandmore-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem-----	25
					Sand bluestem-----	20
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial grasses	8
					Indiangrass-----	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Switchgrass-----	5
					Miscellaneous perennial forbs--	2
GfsA: Gracemore-----	Subirrigated (saline) PE 31-44 R078XY097OK	6,000	5,000	4,500	Alkali sacaton-----	20
					Switchgrass-----	15
					Inland saltgrass-----	10
					Miscellaneous perennial forbs--	10
					Miscellaneous perennial grasses	10
					Indiangrass-----	5
					Alkali muhly-----	5
					Miscellaneous trees-----	5
					Prairie cordgrass-----	5
					Sedge-----	5
					Sunflower-----	5
					Western wheatgrass-----	5
GmrA: Gracemont-----	Subirrigated PE 31-44 R078XY095OK	10,000	7,000	5,000	Switchgrass-----	25
					Indiangrass-----	15
					Alkali sacaton-----	10
					Miscellaneous perennial forbs--	10
					Alkali muhly-----	5
					Eastern gamagrass-----	5
					Inland saltgrass-----	5
					Miscellaneous perennial grasses	5
					Prairie cordgrass-----	5
					Sedge-----	5
					Sunflower-----	5
					Western wheatgrass-----	5



Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
GmsA: Gracemont-----	Subirrigated (saline) PE 31-44 R078XY097OK	6,000	5,000	4,500	Alkali sacaton----- Switchgrass----- Inland saltgrass----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Indiangrass----- Alkali muhly----- Miscellaneous trees----- Prairie cordgrass----- Sedge----- Sunflower----- Western wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
GrmA: Gracemore-----	Subirrigated (saline) PE 31-44 R078XY097OK	6,000	5,000	4,500	Alkali sacaton----- Switchgrass----- Inland saltgrass----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Indiangrass----- Alkali muhly----- Miscellaneous trees----- Prairie cordgrass----- Sedge----- Sunflower----- Western wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
HdGB: Hardeman-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem----- Sand bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Indiangrass----- Sand lovegrass----- Sand sagebrush----- Switchgrass----- Miscellaneous perennial forbs--	25 20 15 10 8 5 5 5 5 2

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
HdGB: Grandmore-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem-----	25
					Sand bluestem-----	20
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial grasses	8
					Indiangrass-----	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Switchgrass-----	5
					Miscellaneous perennial forbs--	2
HdGC: Hardeman-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem-----	25
					Sand bluestem-----	20
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial grasses	8
					Indiangrass-----	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Switchgrass-----	5
					Miscellaneous perennial forbs--	2
Grandmore-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem-----	25
					Sand bluestem-----	20
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial grasses	8
					Indiangrass-----	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Switchgrass-----	5
					Miscellaneous perennial forbs--	2
HdmB: Hardeman-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem-----	25
					Sand bluestem-----	20
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial grasses	8
					Indiangrass-----	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Switchgrass-----	5
					Miscellaneous perennial forbs--	2

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
HdmC: Hardeman-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem----- Sand bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Indiangrass----- Sand lovegrass----- Sand sagebrush----- Switchgrass----- Miscellaneous perennial forbs--	25 20 15 10 8 5 5 5 5 2
IreA: Irene-----	Loamy Prairie PE 30-40 R077EY056OK	3,500	2,800	2,000	Indiangrass----- Little bluestem----- Sand bluestem----- Miscellaneous perennial forbs-- Sideoats grama----- Switchgrass----- Annual grasses----- Blue grama----- Buffalograss----- Miscellaneous perennial grasses Tall dropseed-----	15 15 15 10 10 10 5 5 5 5 5
IreB: Irene-----	Loamy Prairie PE 30-40 R077EY056OK	3,500	2,800	2,000	Indiangrass----- Little bluestem----- Sand bluestem----- Miscellaneous perennial forbs-- Sideoats grama----- Switchgrass----- Annual grasses----- Blue grama----- Buffalograss----- Miscellaneous perennial grasses Tall dropseed-----	15 15 15 10 10 10 5 5 5 5 5

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
IreC: Irene-----	Loamy Prairie PE 30-40 R077EY056OK	3,500	2,800	2,000	Indiangrass-----	15
					Little bluestem-----	15
					Sand bluestem-----	15
					Miscellaneous perennial forbs--	10
					Sideoats grama-----	10
					Switchgrass-----	10
					Annual grasses-----	5
					Blue grama-----	5
					Buffalograss-----	5
					Miscellaneous perennial grasses	5
IreD: Irene-----	Loamy Prairie PE 30-40 R077EY056OK	3,500	2,800	2,000	Tall dropseed-----	5
					Indiangrass-----	15
					Little bluestem-----	15
					Sand bluestem-----	15
					Miscellaneous perennial forbs--	10
					Sideoats grama-----	10
					Switchgrass-----	10
					Annual grasses-----	5
					Blue grama-----	5
					Buffalograss-----	5
JssF: Jester-----	Dune PE 31-44 R078XY022OK	1,600	1,200	800	Miscellaneous perennial grasses	5
					Tall dropseed-----	5
					Sand bluestem-----	25
					Little bluestem-----	15
					Miscellaneous shrubs-----	12
					Blue grama-----	10
					Switchgrass-----	10
					Miscellaneous perennial forbs--	5
					Miscellaneous perennial grasses	5
					Sand dropseed-----	5
					Sand lovegrass-----	5
					Sideoats grama-----	5
					Giant sandreed-----	3

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
JstC: Jester-----	Deep Sand PE 31-44 R078XY014OK	3,500	2,400	1,700	Sand bluestem-----	25
					Little bluestem-----	20
					Miscellaneous shrubs-----	10
					Switchgrass-----	10
					Indiangrass-----	5
					Blue grama-----	5
					Miscellaneous perennial forbs--	5
					Miscellaneous perennial grasses	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Sideoats grama-----	5
KidB: Kingsdown-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem-----	25
					Sand bluestem-----	20
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial grasses	8
					Indiangrass-----	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Switchgrass-----	5
					Miscellaneous perennial forbs--	2
KiHE: Kingsdown-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem-----	25
					Sand bluestem-----	20
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial grasses	8
					Indiangrass-----	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Switchgrass-----	5
					Miscellaneous perennial forbs--	2

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
KiHE: Hardeman-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem-----	25
					Sand bluestem-----	20
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial grasses	8
					Indiangrass-----	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Switchgrass-----	5
					Miscellaneous perennial forbs--	2
LgtA: Lugert-----	Loamy Bottomland PE 31-44 R078XY050OK	5,500	4,000	3,000	Sand bluestem-----	25
					Indiangrass-----	15
					Miscellaneous perennial grasses	15
					Switchgrass-----	15
					Little bluestem-----	10
					Miscellaneous perennial forbs--	10
					Eastern gamagrass-----	5
					Miscellaneous trees-----	5
LiJC: Lincoln-----	Sandy Bottomland PE 31-44 R078XY068OK	4,800	3,700	2,900	Sand bluestem-----	15
					Indiangrass-----	15
					Miscellaneous perennial grasses	15
					Switchgrass-----	15
					Annual grasses-----	10
					Little bluestem-----	5
					Miscellaneous perennial forbs--	10
					Canada wildrye-----	5
					Miscellaneous trees-----	5
					Threeawn-----	5
Jester-----	Deep Sand PE 31-44 R078XY014OK	3,500	2,400	1,700	Sand bluestem-----	25
					Little bluestem-----	20
					Miscellaneous shrubs-----	10
					Switchgrass-----	10
					Indiangrass-----	5
					Blue grama-----	5
					Miscellaneous perennial forbs--	5
					Miscellaneous perennial grasses	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Sideoats grama-----	5

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
LikB: Likes-----	Deep Sand PE 30-40 R077EY014OK	3,500	2,400	1,700	Sand bluestem----- Little bluestem----- Miscellaneous shrubs----- Switchgrass----- Indiangrass----- Blue grama----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Sand lovegrass----- Sand sagebrush----- Sideoats grama-----	25 20 10 10 5 5 5 5 5 5 5
LisA: Lincoln-----	Sandy Bottomland PE 31-44 R078XY068OK	4,800	3,700	2,900	Sand bluestem----- Indiangrass----- Miscellaneous perennial grasses Switchgrass----- Annual grasses----- Little bluestem----- Miscellaneous perennial forbs-- Canada wildrye----- Miscellaneous trees----- Threeawn-----	15 15 15 15 10 5 10 5 5 5
LncA: Lincoln-----	Loamy Bottomland PE 31-44 R078XY050OK	4,800	3,700	2,900	Sand bluestem----- Indiangrass----- Miscellaneous perennial grasses Switchgrass----- Annual grasses----- Little bluestem----- Miscellaneous perennial forbs-- Canada wildrye----- Miscellaneous trees----- Threeawn-----	15 15 15 15 10 5 10 5 5 5

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
LROE: Laverne-----	Shallow PE 22-28 R077XY082OK	1,800	1,400	1,000	Sideoats grama----- Little bluestem----- Blue grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Miscellaneous shrubs----- Sand bluestem----- Sand dropseed----- Silver bluestem-----	30 20 10 5 5 5 5 5 5 5 5
Rock outcrop.						
LshA: Lesho-----	Subirrigated PE 31-44 R078XY095OK	10,000	7,000	5,000	Switchgrass----- Indiangrass----- Alkali sacaton----- Miscellaneous perennial forbs-- Alkali muhly----- Eastern gamagrass----- Inland saltgrass----- Miscellaneous perennial grasses Miscellaneous trees----- Prairie cordgrass----- Sedge----- Sunflower----- Western wheatgrass-----	25 10 10 10 5 5 5 5 5 5 5 5
LsoA: Lincoln-----	Sandy Bottomland PE 31-44 R078XY068OK	4,800	3,700	2,900	Sand bluestem----- Indiangrass----- Miscellaneous perennial grasses Switchgrass----- Annual grasses----- Little bluestem----- Miscellaneous perennial forbs-- Canada wildrye----- Miscellaneous trees----- Threeawn-----	15 15 15 15 10 5 10 5 5 5
M-W: Water, Miscellaneous.						



Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
MLBB: Mobeetie-----	Limy Upland PE 30-40 R077EY048OK	2,300	1,600	1,200	Sand bluestem-----	30
					Little bluestem-----	20
					Sideoats grama-----	15
					Indiangrass-----	10
					Canada wildrye-----	5
					Blue grama-----	5
					Miscellaneous perennial forbs--	5
					Miscellaneous shrubs-----	5
					Switchgrass-----	5
Likes-----	Deep Sand PE 30-40 R077EY014OK	3,500	2,400	1,700	Sand bluestem-----	25
					Little bluestem-----	20
					Miscellaneous shrubs-----	10
					Switchgrass-----	10
					Indiangrass-----	5
					Blue grama-----	5
					Miscellaneous perennial forbs--	5
					Miscellaneous perennial grasses	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Sideoats grama-----	5
Berda-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama-----	20
					Little bluestem-----	20
					Miscellaneous perennial grasses	20
					Sideoats grama-----	20
					Buffalograss-----	5
					Hairy grama-----	5
					Miscellaneous perennial forbs--	5
					Sand bluestem-----	3
					Indiangrass-----	2
MLBC: Mobeetie-----	Limy Upland PE 30-40 R077EY048OK	2,300	1,600	1,200	Sand bluestem-----	30
					Little bluestem-----	20
					Sideoats grama-----	15
					Indiangrass-----	10
					Canada wildrye-----	5
					Blue grama-----	5
					Miscellaneous perennial forbs--	5
					Miscellaneous shrubs-----	5
					Switchgrass-----	5

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
MLBC: Likes-----	Deep Sand PE 30-40 R077EY014OK	3,500	2,400	1,700	Sand bluestem-----	25
					Little bluestem-----	20
					Miscellaneous shrubs-----	10
					Switchgrass-----	10
					Indiangrass-----	5
					Blue grama-----	5
					Miscellaneous perennial forbs--	5
					Miscellaneous perennial grasses	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
Berda-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Sideoats grama-----	5
					Blue grama-----	20
					Little bluestem-----	20
					Miscellaneous perennial grasses	20
					Sideoats grama-----	20
					Buffalograss-----	5
					Hairy grama-----	5
					Miscellaneous perennial forbs--	5
					Sand bluestem-----	3
					Indiangrass-----	2
MLBE: Mobeetie-----	Limy Upland PE 30-40 R077EY048OK	2,300	1,600	1,200	Sand bluestem-----	30
					Little bluestem-----	20
					Sideoats grama-----	15
					Indiangrass-----	10
					Canada wildrye-----	5
					Blue grama-----	5
					Miscellaneous perennial forbs--	5
					Miscellaneous shrubs-----	5
					Switchgrass-----	5
Likes-----	Deep Sand PE 30-40 R077EY014OK	3,500	2,400	1,700	Sand bluestem-----	25
					Little bluestem-----	20
					Miscellaneous shrubs-----	10
					Switchgrass-----	10
					Indiangrass-----	5
					Blue grama-----	5
					Miscellaneous perennial forbs--	5
					Miscellaneous perennial grasses	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Sideoats grama-----	5

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
MLBE: Berda-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2
MnsB: Mansic-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2
MnsC: Mansic-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2
MsnB: Manson-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
MsnC: Manson-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2
MsnC2: Manson-----	Reseeded Limy Upland PE 30-40 R077EY848OK	1,900	1,300	800	---	---
OMBE: Okklark-----	Limy Sandy Plains PE 30- 40 R077EY049OK	2,300	1,600	1,200	Sand bluestem----- Little bluestem----- Sideoats grama----- Indiangrass----- Canada wildrye----- Blue grama----- Miscellaneous perennial forbs-- Miscellaneous shrubs----- Switchgrass-----	30 20 15 10 5 5 5 5 5
Mansic-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2
Berda-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
OMBG: Oklark-----	Limy Sandy Plains PE 30-40 R077EY049OK	2,300	1,600	1,200	Sand bluestem-----	30
					Little bluestem-----	20
					Sideoats grama-----	15
					Indiangrass-----	10
					Canada wildrye-----	5
					Blue grama-----	5
					Miscellaneous perennial forbs--	5
					Miscellaneous shrubs-----	5
					Switchgrass-----	5
Mansic-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama-----	20
					Little bluestem-----	20
					Miscellaneous perennial grasses	20
					Sideoats grama-----	20
					Buffalograss-----	5
					Hairy grama-----	5
					Miscellaneous perennial forbs--	5
					Sand bluestem-----	3
					Indiangrass-----	2
Berda-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama-----	20
					Little bluestem-----	20
					Miscellaneous perennial grasses	20
					Sideoats grama-----	20
					Buffalograss-----	5
					Hairy grama-----	5
					Miscellaneous perennial forbs--	5
					Sand bluestem-----	3
					Indiangrass-----	2
PdoA: Paloduro-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama-----	20
					Little bluestem-----	20
					Miscellaneous perennial grasses	20
					Sideoats grama-----	20
					Buffalograss-----	5
					Hairy grama-----	5
					Miscellaneous perennial forbs--	5
					Sand bluestem-----	3
					Indiangrass-----	2

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
PdoB: Paloduro-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2
PdoC2: Paloduro-----	Reseeded Limy Upland PE 30-40 R077EY848OK	1,900	1,300	800	---	---
PIT: Pits.						
PlmB: Plemons-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2
PlmC: Plemons-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
PlmD: Plemons-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2
QnWC3: Quinlan-----	Reseeded Shallow Prairie PE 31-44 R078XY883OK	1,600	1,200	900	---	---
Woodward-----	Reseeded Loamy Prairie PE 31-44 R078XY856OK	2,600	1,800	1,300	---	---
QnWD: Quinlan-----	Shallow Prairie (north) PE 31-44 R078XY083OK	2,500	1,800	1,300	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Sand bluestem----- Buffalograss----- Sand dropseed----- Threeawn-----	30 15 10 10 10 10 5 5 5
Woodward-----	Loamy Prairie (cal) PE 31-44 R078XY057OK	3,500	2,800	2,000	Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Blue grama----- Buffalograss----- Indiangrass----- Annual grasses----- Miscellaneous perennial forbs-- Sand bluestem----- Switchgrass----- Tall dropseed-----	20 15 15 10 10 5 5 5 5 5

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
QnWE: Quinlan-----	Shallow Prairie (north) PE 31-44 R078XY083OK	2,500	1,800	1,300	Little bluestem-----	30
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial forbs--	10
					Miscellaneous perennial grasses	10
					Sand bluestem-----	10
					Buffalograss-----	5
					Sand dropseed-----	5
					Threeawn-----	5
Woodward-----	Loamy Prairie (cal) PE 31-44 R078XY057OK	3,500	2,800	2,000	Little bluestem-----	20
					Miscellaneous perennial grasses	15
					Sideoats grama-----	15
					Blue grama-----	10
					Buffalograss-----	10
					Indiangrass-----	5
					Annual grasses-----	5
					Miscellaneous perennial forbs--	5
					Sand bluestem-----	5
					Switchgrass-----	5
					Tall dropseed-----	5
QRWG: Quinlan-----	Loamy Breaks PE 31-44 R078XY005OK	1,800	1,200	1,000	Little bluestem-----	25
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial forbs--	10
					Sand bluestem-----	10
					American plum-----	5
					Buffalograss-----	5
					Miscellaneous perennial grasses	5
					Sand dropseed-----	5
					Skunkbush sumac-----	5
					Threeawn-----	5
Rock outcrop.						



Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
QRWG: Woodward-----	Loamy Prairie (cal) PE 31-44 R078XY057OK	3,500	2,800	2,000	Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Blue grama----- Buffalograss----- Indiangrass----- Annual grasses----- Miscellaneous perennial forbs-- Sand bluestem----- Switchgrass----- Tall dropseed-----	20 15 15 10 10 5 5 5 5 5 5
QRYG: Quinlan-----	Loamy Breaks PE 31-44 R078XY005OK	1,800	1,200	1,000	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial forbs-- Sand bluestem----- American plum----- Buffalograss----- Miscellaneous perennial grasses Sand dropseed----- Skunkbush sumac----- Threeawn-----	25 15 10 10 10 5 5 5 5 5 5
Rock outcrop. Yomont-----	Loamy Bottomland PE 31-44 R078XY050OK	5,500	4,000	3,000	Sand bluestem----- Indiangrass----- Miscellaneous perennial grasses Switchgrass----- Little bluestem----- Miscellaneous perennial forbs-- Eastern gamagrass----- Miscellaneous trees-----	25 15 15 15 10 10 5 5

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
QWDE: Quinlan-----	Shallow Prairie (north) PE 31-44 R078XY083OK	2,500	1,800	1,300	Little bluestem-----	30
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial forbs--	10
					Miscellaneous perennial grasses	10
					Sand bluestem-----	10
					Buffalograss-----	5
					Sand dropseed-----	5
					Threeawn-----	5
Woodward-----	Loamy Prairie (cal) PE 31-44 R078XY057OK	3,500	2,800	2,000	Little bluestem-----	20
					Miscellaneous perennial grasses	15
					Sideoats grama-----	15
					Blue grama-----	10
					Buffalograss-----	10
					Indiangrass-----	5
					Annual grasses-----	5
					Miscellaneous perennial forbs--	5
					Sand bluestem-----	5
					Switchgrass-----	5
Deepwood-----	Loamy Prairie (cal) PE 31-44 R078XY057OK	3,500	2,800	2,000	Tall dropseed-----	5
					Little bluestem-----	20
					Miscellaneous perennial grasses	15
					Sideoats grama-----	15
					Blue grama-----	10
					Buffalograss-----	10
					Indiangrass-----	5
					Annual grasses-----	5
					Miscellaneous perennial forbs--	5
					Sand bluestem-----	5
QWRC: Quinlan-----	Shallow Prairie (north) PE 31-44 R078XY083OK	2,500	1,800	1,300	Switchgrass-----	5
					Tall dropseed-----	5
					Little bluestem-----	30
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial forbs--	10
					Miscellaneous perennial grasses	10
					Sand bluestem-----	10
					Buffalograss-----	5
					Sand dropseed-----	5
					Threeawn-----	5

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
QWRC: Woodward-----	Loamy Prairie (cal) PE 31-44 R078XY057OK	3,500	2,800	2,000	Little bluestem-----	20
					Miscellaneous perennial grasses	15
					Sideoats grama-----	15
					Blue grama-----	10
					Buffalograss-----	10
					Indiangrass-----	5
					Annual grasses-----	5
					Miscellaneous perennial forbs--	5
					Sand bluestem-----	5
					Switchgrass-----	5
					Tall dropseed-----	5
Rock outcrop.						
RoCH: Rock outcrop.						
Cottonwood-----	Gyp PE 31-44 R078XY038OK	1,800	1,200	1,000	Little bluestem-----	25
					Sideoats grama-----	20
					Blue grama-----	10
					Buffalograss-----	10
					Sand dropseed-----	10
					Gumweed-----	5
					Hairy goldenaster-----	5
					Hairy grama-----	5
					Hairy woollygrass-----	2
					Miscellaneous perennial forbs--	5
					Juniper-----	2
					Rough tridens-----	1
RssA: Rosston-----	Depressional Upland PE 30-40 R077EY098OK	1,500	700	400	Barnyardgrass-----	15
					Blue grama-----	15
					Buffalograss-----	10
					Miscellaneous perennial forbs--	10
					Miscellaneous perennial grasses	10
					Sedge-----	10
					Switchgrass-----	10
					Western wheatgrass-----	10
					Annual grasses-----	5
					Other annual forbs-----	5
SAL: Salt flats.						

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
SelA: Selman-----	Loamy Prairie PE 31-44 R078XY056OK	4,200	2,800	2,000	Sand bluestem----- Indiangrass----- Switchgrass----- Little bluestem----- Miscellaneous perennial forbs-- Blue grama----- Miscellaneous perennial grasses Miscellaneous trees----- Sideoats grama----- Western wheatgrass-----	25 15 15 10 10 5 5 5 5 5
SelB: Selman-----	Loamy Prairie PE 31-44 R078XY056OK	4,200	2,800	2,000	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial forbs-- Sand bluestem----- American plum----- Buffalograss----- Miscellaneous perennial grasses Sand dropseed----- Skunkbush sumac----- Threeawn-----	25 15 10 10 10 5 5 5 5 5 5
SelC: Selman-----	Loamy Prairie PE 31-44 R078XY056OK	4,200	2,800	2,000	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial forbs-- Sand bluestem----- American plum----- Buffalograss----- Miscellaneous perennial grasses Sand dropseed----- Skunkbush sumac----- Threeawn-----	25 15 10 10 10 5 5 5 5 5 5
SelC2: Selman-----	Reseeded Loamy Prairie PE 31-44 R078XY856OK	2,200	1,400	1,000	---	---

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
SelD: Selman-----	Loamy Prairie PE 31-44 R078XY056OK	4,200	2,800	2,000	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial forbs-- Sand bluestem----- American plum----- Buffalograss----- Miscellaneous perennial grasses Sand dropseed----- Skunkbush sumac----- Threeawn-----	25 15 10 10 10 5 5 5 5 5 5
SelD2: Selman-----	Reseeded Loamy Prairie PE 31-44 R078XY856OK	2,200	1,400	1,000	---	---
SprA: Spr-----	Loamy Bottomland PE 31-44 R078XY050OK	5,500	4,000	3,000	Sand bluestem----- Indiangrass----- Miscellaneous perennial grasses Switchgrass----- Little bluestem----- Miscellaneous perennial forbs-- Eastern gamagrass----- Miscellaneous trees-----	25 15 15 15 10 10 5 5
SpsA: Spr-----	Loamy Saline Bottomland PE 34-44 R078CY047OK	3,300	2,300	1,600	Alkali sacaton----- Switchgrass----- Inland saltgrass----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Indiangrass----- Alkali muhly----- Miscellaneous trees----- Prairie cordgrass----- Sedge----- Sunflower----- Western wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
StpA: St. Paul-----	Loamy Prairie PE 31-44 R078XY056OK	4,200	2,800	2,000	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial forbs-- Sand bluestem----- American plum----- Buffalograss----- Miscellaneous perennial grasses Sand dropseed----- Skunkbush sumac----- Threeawn-----	25 15 10 10 10 5 5 5 5 5 5
StpB: St. Paul-----	Loamy Prairie PE 31-44 R078XY056OK	4,200	2,800	2,000	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial forbs-- Sand bluestem----- American plum----- Buffalograss----- Miscellaneous perennial grasses Sand dropseed----- Skunkbush sumac----- Threeawn-----	25 15 10 10 10 5 5 5 5 5 5
StpC: St. Paul-----	Loamy Prairie PE 31-44 R078XY056OK	4,200	2,800	2,000	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial forbs-- Sand bluestem----- American plum----- Buffalograss----- Miscellaneous perennial grasses Sand dropseed----- Skunkbush sumac----- Threeawn-----	25 15 10 10 10 5 5 5 5 5 5

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
StpD: St. Paul-----	Loamy Prairie PE 31-44 R078XY056OK	4,200	2,800	2,000	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial forbs-- Sand bluestem----- American plum----- Buffalograss----- Miscellaneous perennial grasses Sand dropseed----- Skunkbush sumac----- Threeawn-----	25 15 10 10 10 5 5 5 5 5 5
TeWE: Teagard-----	Shale PE 31-44 R078XY100OK	1,000	700	400	Little bluestem----- Sideoats grama----- Miscellaneous perennial grasses Blue grama----- Miscellaneous perennial forbs-- Indiangrass----- Buffalograss----- Sand bluestem-----	30 20 15 10 10 5 5 5
Wellsford-----	Shale PE 31-44 R078XY100OK	1,000	700	400	Little bluestem----- Sideoats grama----- Miscellaneous perennial grasses Blue grama----- Miscellaneous perennial forbs-- Indiangrass----- Buffalograss----- Sand bluestem-----	30 20 15 10 10 5 5 5
TexA: Texroy-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,300	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		<i>Lb/acre</i>	<i>Lb/acre</i>	<i>Lb/acre</i>		<i>Pct</i>
TexB: Texroy-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2
TexC: Texroy-----	Limy Upland PE 30-40 R077EY048OK	3,000	2,200	1,700	Blue grama----- Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass-----	20 20 20 20 5 5 5 3 2
TipA: Tipton-----	Loamy Prairie PE 31-44 R078XY056OK	4,200	2,800	2,000	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial forbs-- Sand bluestem----- American plum----- Buffalograss----- Miscellaneous perennial grasses Sand dropseed----- Skunkbush sumac----- Threeawn-----	25 15 10 10 10 5 5 5 5 5 5



Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
TipB: Tipton-----	Loamy Prairie PE 31-44 R078XY056OK	4,200	2,800	2,000	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial forbs-- Sand bluestem----- American plum----- Buffalograss----- Miscellaneous perennial grasses Sand dropseed----- Skunkbush sumac----- Threeawn-----	25 15 10 10 10 5 5 5 5 5 5
TipC: Tipton-----	Loamy Prairie PE 31-44 R078XY056OK	4,200	2,800	2,000	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial forbs-- Sand bluestem----- American plum----- Buffalograss----- Miscellaneous perennial grasses Sand dropseed----- Skunkbush sumac----- Threeawn-----	25 15 10 10 10 5 5 5 5 5 5
TipD: Tipton-----	Loamy Prairie PE 31-44 R078XY056OK	4,200	2,800	2,000	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial forbs-- Sand bluestem----- American plum----- Buffalograss----- Miscellaneous perennial grasses Sand dropseed----- Skunkbush sumac----- Threeawn-----	25 15 10 10 10 5 5 5 5 5 5

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
TRQC: Talpa-----	Very Shallow PE 31-44 R078XY098OK	1,800	1,400	1,000	Sideoats grama----- Little bluestem----- Blue grama----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Miscellaneous shrubs----- Sand bluestem----- Sand dropseed----- Silver bluestem-----	30 20 10 5 5 5 5 5 5 5 5
Rock outcrop.  Quinlan-----	Shallow Prairie (north) PE 31-44 R078XY083OK	2,500	1,800	1,300	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Sand bluestem----- Buffalograss----- Sand dropseed----- Threeawn-----	30 15 10 10 10 10 5 5 5
TvlC: Tivoli-----	Deep Sand PE 31-44 R078XY014OK	3,500	2,400	1,700	Sand bluestem----- Little bluestem----- Miscellaneous shrubs----- Switchgrass----- Indiangrass----- Blue grama----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Sand lovegrass----- Sand sagebrush----- Sideoats grama-----	25 20 10 10 5 5 5 5 5 5 5

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
TvlE: Tivoli-----	Dune PE 31-44 R078XY022OK	1,600	1,200	800	Sand bluestem-----	25
					Little bluestem-----	15
					Miscellaneous shrubs-----	12
					Blue grama-----	10
					Switchgrass-----	10
					Miscellaneous perennial forbs--	5
					Miscellaneous perennial grasses	5
					Sand dropseed-----	5
					Sand lovegrass-----	5
					Sideoats grama-----	5
					Giant sandreed-----	3
TvlG: Tivoli-----	Dune PE 31-44 R078XY022OK	1,600	1,200	800	Sand bluestem-----	25
					Little bluestem-----	15
					Miscellaneous shrubs-----	12
					Blue grama-----	10
					Switchgrass-----	10
					Miscellaneous perennial forbs--	5
					Miscellaneous perennial grasses	5
					Sand dropseed-----	5
					Sand lovegrass-----	5
					Sideoats grama-----	5
					Giant sandreed-----	3
VerB: Vernon-----	Clay Prairie (south) PE 31-44 R078XY031OK	2,200	1,500	800	Sideoats grama-----	30
					Buffalograss-----	15
					Blue grama-----	10
					Miscellaneous perennial grasses	10
					Hairy grama-----	5
					Little bluestem-----	5
					Other annual forbs-----	5
					Miscellaneous perennial forbs--	5
					Silver bluestem-----	5
					Vine mesquite-----	5
					Western wheatgrass-----	5

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
VerC: Vernon-----	Clay Prairie (south) PE 31-44 R078XY031OK	2,200	1,500	800	Sideoats grama----- Buffalograss----- Blue grama----- Miscellaneous perennial grasses Hairy grama----- Little bluestem----- Other annual forbs----- Miscellaneous perennial forbs-- Silver bluestem----- Vine mesquite----- Western wheatgrass-----	30 15 10 10 5 5 5 5 5 5 5
VerD: Vernon-----	Clay Prairie (south) PE 31-44 R078XY031OK	2,200	1,500	800	Sideoats grama----- Buffalograss----- Blue grama----- Miscellaneous perennial grasses Hairy grama----- Little bluestem----- Other annual forbs----- Miscellaneous perennial forbs-- Silver bluestem----- Vine mesquite----- Western wheatgrass-----	30 15 10 10 5 5 5 5 5 5 5
VrrB: Vernon-----	Shallow Sandy Prairie PE 34-44 R078CY074OK	3,000	2,100	1,400	Little bluestem----- Sand bluestem----- Sideoats grama----- Blue grama----- Indiangrass----- Sand lovegrass----- Sand sagebrush----- Switchgrass-----	25 20 15 10 5 10 10 5
VrrC: Vernon-----	Shallow Sandy Prairie PE 34-44 R078CY074OK	3,000	2,100	1,400	Little bluestem----- Sand bluestem----- Sideoats grama----- Blue grama----- Indiangrass----- Sand lovegrass----- Sand sagebrush----- Switchgrass-----	25 20 15 10 5 10 10 5

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		<i>Lb/acre</i>	<i>Lb/acre</i>	<i>Lb/acre</i>		<i>Pct</i>
W: Water.						
WodA: Woods-----	Hardland PE 30-40 R077EY0400K	2,000	1,500	1,000	Blue grama----- Sideoats grama----- Buffalograss----- Miscellaneous perennial grasses Western wheatgrass----- Miscellaneous perennial forbs--	35 20 15 15 10 5
WodB: Woods-----	Hardland PE 30-40 R077EY0400K	2,000	1,500	1,000	Blue grama----- Sideoats grama----- Buffalograss----- Miscellaneous perennial grasses Western wheatgrass----- Miscellaneous perennial forbs--	35 20 15 15 10 5
WodC: Woods-----	Hardland PE 30-40 R077EY0400K	2,000	1,500	1,000	Blue grama----- Sideoats grama----- Buffalograss----- Miscellaneous perennial grasses Western wheatgrass----- Miscellaneous perennial forbs--	35 20 15 15 10 5
WQHE: Westola-----	Loamy Bottomland PE 31-44 R078XY0500K	5,500	4,000	3,000	Sand bluestem----- Indiangrass----- Miscellaneous perennial grasses Switchgrass----- Little bluestem----- Miscellaneous perennial forbs-- Eastern gamagrass----- Miscellaneous trees-----	25 15 15 15 10 10 5 5
Quinlan-----	Shallow Prairie (north) PE 31-44 R078XY0830K	2,500	1,800	1,300	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Sand bluestem----- Buffalograss----- Sand dropseed----- Threeawn-----	30 15 10 10 10 10 5 5 5

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
WQHE: Hardeman-----	Sandy Prairie PE 31-44 R078XY073OK	4,000	2,800	2,000	Little bluestem-----	25
					Sand bluestem-----	20
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial grasses	8
					Indiangrass-----	5
					Sand lovegrass-----	5
					Sand sagebrush-----	5
					Switchgrass-----	5
					Miscellaneous perennial forbs--	2
WQnB: Woodward-----	Loamy Prairie (cal) PE 31-44 R078XY057OK	3,500	2,800	2,000	Little bluestem-----	20
					Miscellaneous perennial grasses	15
					Sideoats grama-----	15
					Blue grama-----	10
					Buffalograss-----	10
					Indiangrass-----	5
					Annual grasses-----	5
					Miscellaneous perennial forbs--	5
					Sand bluestem-----	5
					Switchgrass-----	5
Quinlan-----	Shallow Prairie (north) PE 31-44 R078XY083OK	2,500	1,800	1,300	Tall dropseed-----	5
					Little bluestem-----	30
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial forbs--	10
					Miscellaneous perennial grasses	10
					Sand bluestem-----	10
					Buffalograss-----	5
					Sand dropseed-----	5
					Threeawn-----	5

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
WQnC: Woodward-----	Loamy Prairie (cal) PE 31-44 R078XY057OK	3,500	2,800	2,000	Little bluestem-----	20
					Miscellaneous perennial grasses	15
					Sideoats grama-----	15
					Blue grama-----	10
					Buffalograss-----	10
					Indiangrass-----	5
					Annual grasses-----	5
					Miscellaneous perennial forbs--	5
					Sand bluestem-----	5
					Switchgrass-----	5
					Tall dropseed-----	5
Quinlan-----	Shallow Prairie (north) PE 31-44 R078XY083OK	2,500	1,800	1,300	Little bluestem-----	30
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial forbs--	10
					Miscellaneous perennial grasses	10
					Sand bluestem-----	10
					Buffalograss-----	5
					Sand dropseed-----	5
					Threeawn-----	5
WslA: Westola-----	Loamy Bottomland PE 31-44 R078XY050OK	5,500	4,000	3,000	Sand bluestem-----	25
					Indiangrass-----	15
					Miscellaneous perennial grasses	15
					Switchgrass-----	15
					Little bluestem-----	10
					Miscellaneous perennial forbs--	10
					Eastern gamagrass-----	5
					Miscellaneous trees-----	5
WstA: Westola-----	Loamy Bottomland PE 31-44 R078XY050OK	5,500	4,000	3,000	Sand bluestem-----	25
					Indiangrass-----	15
					Miscellaneous perennial grasses	15
					Switchgrass-----	15
					Little bluestem-----	10
					Miscellaneous perennial forbs--	10
					Eastern gamagrass-----	5
					Miscellaneous trees-----	5

Table 9.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
YmrA: Yomont-----	Loamy Bottomland PE 31-44 R078XY0500K	5,500	4,000	3,000	Sand bluestem-----	25
					Indiangrass-----	15
					Miscellaneous perennial grasses	15
					Switchgrass-----	15
					Little bluestem-----	10
					Miscellaneous perennial forbs--	10
					Eastern gamagrass-----	5
					Miscellaneous trees-----	5
YmtA: Yomont-----	Loamy Bottomland PE 31-44 R078XY0500K	5,500	4,000	3,000	Sand bluestem-----	25
					Indiangrass-----	15
					Miscellaneous perennial grasses	15
					Switchgrass-----	15
					Little bluestem-----	10
					Miscellaneous perennial forbs--	10
					Eastern gamagrass-----	5
					Miscellaneous trees-----	5



## Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low and high growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Windbreaks are often planted on land that did not originally support trees. Knowledge of how trees perform on such land can be gained only by observing and recording the performance of trees that have been planted and have survived. Many popular windbreak species are not indigenous to the areas in which they are planted.

Each tree or shrub species has certain climatic and physiographic limits. Within these parameters, a tree or shrub may grow well or grow poorly, depending on the characteristics of the soil. Each tree or shrub has definable potential heights in a given physiographic area and under given climatic conditions. Accurate definitions of potential heights are necessary when a windbreak is planned and designed.

Table 10, "Windbreaks and Environmental Plantings," shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in this table are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Natural Resources Conservation Service or the Cooperative Extension Service or from a nursery.

Table 10.--Windbreaks and Environmental Plantings

[Absence of an entry indicates that trees generally do not grow to the given height]

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
AbbA: Abbie-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
AbbB: Abbie-----	---	American plum, Amur honeysuckle, common lilac, eastern redbud, oriental arborvitae	Ponderosa pine, bur oak, red mulberry, osageorange, common hackberry, lacebark elm, loblolly pine	Black locust
AbbB2: Abbie-----	---	American plum, Amur honeysuckle, common lilac, eastern redbud, oriental arborvitae	Ponderosa pine, bur oak, red mulberry, osageorange, common hackberry, lacebark elm, loblolly pine	Black locust
AbbC: Abbie-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
AbbC2: Abbie-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
AbsB: Abilene-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
AclA: Abbie-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
AflB: Abbie-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
AflC: Abbie-----	---	American plum, Amur honeysuckle, common lilac, eastern redbud, oriental arborvitae	Ponderosa pine, bur oak, red mulberry, osageorange, common hackberry, lacebark elm, loblolly pine	Black locust
BdaB: Berda-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
BdaC: Berda-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
BdaD: Berda-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
CRVE: Cottonwood.  Rock Outcrop.  Vinson-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Common hackberry, lacebark elm, osageorange, ponderosa pine, bur oak, black locust, green ash	---
DAM: Dam.				

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
DevE: Devol-----	American plum	Eastern redbud, oriental arborvitae	Austrian pine, Rocky Mountain juniper, bur oak, common hackberry, green ash, ponderosa pine, lacebark elm, osageorange	Black locust, loblolly pine
DpwB: Deepwood-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
DpwC: Deepwood-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
DpwD: Deepwood-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
DpwE: Deepwood-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
DvlB: Devol-----	American plum	Eastern redbud, oriental arborvitae	Austrian pine, Rocky Mountain juniper, bur oak, common hackberry, green ash, ponderosa pine, lacebark elm, osageorange	Black locust, loblolly pine
DvlC: Devol-----	American plum	Eastern redbud, oriental arborvitae	Austrian pine, Rocky Mountain juniper, bur oak, common hackberry, green ash, ponderosa pine, lacebark elm, osageorange	Black locust, loblolly pine

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
Dv1D: Devol-----	American plum	Eastern redbud, oriental arborvitae	Austrian pine, Rocky Mountain juniper, bur oak, common hackberry, green ash, ponderosa pine, lacebark elm, osageorange	Black locust, loblolly pine
Ed1C: Eda-----	American plum	---	Rocky Mountain juniper, bur oak, oriental arborvitae, ponderosa pine, Austrian pine, osageorange, common hackberry, green ash, lacebark elm, loblolly pine	Black locust
Ed1E: Eda-----	American plum	---	Rocky Mountain juniper, bur oak, oriental arborvitae, ponderosa pine, Austrian pine, osageorange, common hackberry, green ash, lacebark elm, loblolly pine	Black locust
FayB: Farry-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Austrian pine, bur oak, common hackberry, lacebark elm, ponderosa pine, green ash, black locust, loblolly pine	---
FayC: Farry-----	American plum	Eastern redbud, oriental arborvitae	Austrian pine, Rocky Mountain juniper, bur oak, common hackberry, green ash, ponderosa pine, lacebark elm, osageorange	Black locust, loblolly pine
FoFE: Fortyone-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Austrian pine, bur oak, common hackberry, lacebark elm, ponderosa pine, green ash, black locust, loblolly pine	---

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
FoFE: Farry-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Austrian pine, bur oak, common hackberry, lacebark elm, ponderosa pine, green ash, black locust, loblolly pine	---
FrkA: Frankirk-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
FrkB: Frankirk-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
FtnB: Fortyone-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Austrian pine, bur oak, common hackberry, lacebark elm, ponderosa pine, green ash, black locust, loblolly pine	---
FtnC: Fortyone-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Austrian pine, bur oak, common hackberry, lacebark elm, ponderosa pine, green ash, black locust, loblolly pine	---
FtnD: Fortyone-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Austrian pine, bur oak, common hackberry, lacebark elm, ponderosa pine, green ash, black locust, loblolly pine	---
GcsA: Gracemore.				

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
GdfB: Grandfield----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
GdfC: Grandfield----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
GDGE: Grandfield----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
Devol-----	American plum	Eastern redbud, oriental arborvitae	Austrian pine, Rocky Mountain juniper, bur oak, common hackberry, green ash, ponderosa pine, lacebark elm, osageorange	Black locust, loblolly pine
Grandmore-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
GdmB: Grandmore-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
GfsA: Gracemore.				
GmrA: Gracemont.				

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
GmsA: Gracemont.				
GrmA: Gracemore.				
HdGB: Hardeman-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
Grandmore-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
HdGC: Hardeman-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
Grandmore-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
HdmB: Hardeman-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
HdmC: Hardeman-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust



Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
IreA: Irene-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
IreB: Irene-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
IreC: Irene-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
IreD: Irene-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
JssF: Jester-----	American plum	---	Rocky Mountain juniper, bur oak, oriental arborvitae, ponderosa pine, Austrian pine, osageorange, common hackberry, green ash, lacebark elm, loblolly pine	Black locust
JstC: Jester-----	American plum	---	Rocky Mountain juniper, bur oak, oriental arborvitae, ponderosa pine, Austrian pine, osageorange, common hackberry, green ash, lacebark elm, loblolly pine	Black locust

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
KidB: Kingsdown-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
KiHE: Kingsdown-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
Hardeman-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
LgtA: Lugert-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
LiJC: Lincoln-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Austrian pine, bur oak, common hackberry, lacebark elm, ponderosa pine, green ash, black locust, loblolly pine	---
Jester-----	American plum	---	Rocky Mountain juniper, bur oak, oriental arborvitae, ponderosa pine, Austrian pine, osageorange, common hackberry, green ash, lacebark elm, loblolly pine	Black locust

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
LikB: Likes-----	American plum	Eastern redbud, oriental arborvitae	Austrian pine, Rocky Mountain juniper, common hackberry, lacebark elm, osageorange, ponderosa pine, red mulberry, bur oak, green ash, black locust, loblolly pine	---
LisA: Lincoln-----	American plum	---	Rocky Mountain juniper, bur oak, oriental arborvitae, ponderosa pine, Austrian pine, osageorange, common hackberry, green ash, lacebark elm, loblolly pine	Black locust
LncA: Lincoln-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Austrian pine, bur oak, common hackberry, lacebark elm, ponderosa pine, green ash, black locust, loblolly pine	---
LROE: Laverne.  Rock outcrop.				
LshA: Lesho-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
LsoA: Lincoln-----	American plum	---	Rocky Mountain juniper, bur oak, oriental arborvitae, ponderosa pine, Austrian pine, osageorange, common hackberry, green ash, lacebark elm, loblolly pine	Black locust
M-W: Water.				

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
MLBB: Mobeetie-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Austrian pine, ponderosa pine, bur oak, common hackberry, lacebark elm, osageorange, green ash	Black locust
Likes-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Austrian pine, common hackberry, lacebark elm, osageorange, ponderosa pine, red mulberry, green ash, bur oak, black locust	---
Berda-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
MLBC: Mobeetie-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Austrian pine, ponderosa pine, bur oak, common hackberry, lacebark elm, osageorange, green ash	Black locust
Likes-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Austrian pine, common hackberry, lacebark elm, osageorange, ponderosa pine, red mulberry, green ash, bur oak, black locust	---
Berda-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
MLBE: Mobeetie-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Austrian pine, ponderosa pine, bur oak, common hackberry, lacebark elm, osageorange, green ash	Black locust

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
MLBE: Likes-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Austrian pine, common hackberry, lacebark elm, osageorange, ponderosa pine, red mulberry, green ash, bur oak, black locust	---
Berda-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
MnsB: Mansic-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
MnsC: Mansic-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
MsnB: Manson-----	Eastern redbud	Oriental arborvitae, Austrian pine, lacebark elm, osageorange	Bur oak, ponderosa pine, green ash, black locust	---
MsnC: Manson-----	Eastern redbud	Oriental arborvitae, Austrian pine, lacebark elm, osageorange	Bur oak, ponderosa pine, green ash, black locust	---
MsnC2: Manson-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
OMBE: Okllark-----	Eastern redbud	Oriental arborvitae, Austrian pine, lacebark elm, osageorange	Bur oak, ponderosa pine, green ash, black locust	---

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
OMBE: Mansic-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
Berda-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
OMBG: Okark-----	Eastern redbud	Oriental arborvitae, Austrian pine, lacebark elm, osageorange	Bur oak, ponderosa pine, green ash, black locust	---
Mansic-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
Berda-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
PdoA: Paloduro-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
PdoB: Paloduro-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
PdoC2: Paloduro-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
PIT: Pits.				

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
PlmB: Plemons-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
PlmC: Plemons-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
PlmD: Plemons-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
QnWC3: Quinlan.				
Woodward-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Common hackberry, lacebark elm, osageorange, ponderosa pine, bur oak, black locust, green ash	---
QnWD: Quinlan.				
Woodward-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Common hackberry, lacebark elm, osageorange, ponderosa pine, bur oak, black locust, green ash	---
QnWE: Quinlan.				
Woodward-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Common hackberry, lacebark elm, osageorange, ponderosa pine, bur oak, black locust, green ash	---
QRWG: Quinlan.				
Rock outcrop.				

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
QRWG: Woodward-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Common hackberry, lacebark elm, osageorange, ponderosa pine, bur oak, black locust, green ash	---
QRYG: Quinlan.  Rock outcrop.  Yomont-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---
QWDE: Quinlan.  Woodward-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Common hackberry, lacebark elm, osageorange, ponderosa pine, bur oak, black locust, green ash	---
Deepwood-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
QWRC: Quinlan.  Woodward-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Common hackberry, lacebark elm, osageorange, ponderosa pine, bur oak, black locust, green ash	---
Rock outcrop.  RoCH: Rock outcrop.  Cottonwood.  RssA: Rosston.  SAL: Salt flats.				



Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
SelA: Selman-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
SelB: Selman-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
SelC: Selman-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
SelC2: Selman-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
SelD: Selman-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
SelD2: Selman-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
SprA: Spur-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
SpsA: Spur-----	---	Austrian pine	---	---
StpA: St. Paul-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
StpB: St. Paul-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
StpC: St. Paul-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
StpD: St. Paul-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
TeWE: Teagard.  Wellsford.				
TexA: Texroy-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
TexB: Texroy-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
TexC: Texroy-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
TipA: Tipton-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
TipB: Tipton-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
TipC: Tipton-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
TipD: Tipton-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
TRQC: Talpa.  Rock outcrop.  Quinlan.				

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
TvlC: Tivoli-----	American plum	---	Rocky Mountain juniper, bur oak, oriental arborvitae, ponderosa pine, Austrian pine, osageorange, common hackberry, green ash, lacebark elm, loblolly pine	Black locust
TvlE: Tivoli-----	American plum	---	Rocky Mountain juniper, bur oak, oriental arborvitae, ponderosa pine, Austrian pine, osageorange, common hackberry, green ash, lacebark elm, loblolly pine	Black locust
TvlG: Tivoli-----	American plum	---	Rocky Mountain juniper, bur oak, oriental arborvitae, ponderosa pine, Austrian pine, osageorange, common hackberry, green ash, lacebark elm, loblolly pine	Black locust
VerB: Vernon-----	American plum, Amur honeysuckle, common lilac	Eastern redbud, oriental arborvitae	Bur oak, ponderosa pine, osageorange, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
VerC: Vernon-----	American plum, Amur honeysuckle, common lilac	Eastern redbud, oriental arborvitae	Bur oak, ponderosa pine, osageorange, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
VerD: Vernon-----	American plum, Amur honeysuckle, common lilac	Eastern redbud, oriental arborvitae	Bur oak, ponderosa pine, osageorange, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
VrrB: Vernon-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Bur oak, common hackberry, lacebark elm, osageorange, ponderosa pine, green ash, black locust	---
VrrC: Vernon-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Bur oak, common hackberry, lacebark elm, osageorange, ponderosa pine, green ash, black locust	---
W: Water.				
WodA: Woods-----	American plum, Amur honeysuckle, common lilac	Eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
WodB: Woods-----	---	American plum, Amur honeysuckle, common lilac, eastern redbud, oriental arborvitae	Ponderosa pine, bur oak, osageorange, red mulberry, black locust, common hackberry, lacebark elm, loblolly pine	---
WodC: Woods-----	American plum, Amur honeysuckle, common lilac	Eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine
WQHE: Westola-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
Quinlan.				

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
WQHE: Hardeman-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
WQnB: Woodward-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Common hackberry, lacebark elm, osageorange, ponderosa pine, bur oak, black locust, green ash	---
Quinlan.				
WQnC: Woodward-----	American plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Common hackberry, lacebark elm, osageorange, ponderosa pine, bur oak, black locust, green ash	---
Quinlan.				
WslA: Westola-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
WstA: Westola-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust
YmrA: Yomont-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
YmtA: Yomont-----	Eastern redbud	Oriental arborvitae	Austrian pine, bur oak, lacebark elm, osageorange, ponderosa pine, black locust, green ash	---

## Recreation

The soils of the survey area are rated in tables 11a and 11b according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in tables 11a and 11b can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

*Camp areas* require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

*Picnic areas* are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large



stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

*Playgrounds* require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

*Paths and trails* for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

*Off-road motorcycle trails* require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

*Golf fairways* are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

Table 11a.--Recreation, Part I

[The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table]

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AbbA: Abbie-----	100	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50
AbbB: Abbie-----	95	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50
AbbB2: Abbie-----	100	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50
AbbC: Abbie-----	95	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Somewhat limited Slope Dusty	0.50 0.50
AbbC2: Abbie-----	100	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Somewhat limited Slope Dusty	0.50 0.50
AbsB: Abilene-----	85	Not limited		Not limited		Not limited	
AclA: Abbie-----	87	Not limited		Not limited		Not limited	
AflB: Abbie-----	100	Not limited		Not limited		Not limited	
AflC: Abbie-----	100	Not limited		Not limited		Somewhat limited Slope	0.50
BdaB: Berda-----	84	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50
BdaC: Berda-----	80	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Somewhat limited Slope Dusty	0.50 0.50
BdaD: Berda-----	100	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Very limited Slope Dusty	1.00 0.50
CRVE: Cottonwood----	37	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00

Table 11a.--Recreation, Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CRVE: Rock outcrop--	28	Not rated		Not rated		Not rated	
Vinson-----	12	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.50 0.16
DAM: Dam-----	100	Not rated		Not rated		Not rated	
DevE: Devol-----	100	Somewhat limited Too sandy Slope	0.90 0.16	Somewhat limited Too sandy Slope	0.90 0.16	Very limited Slope Too sandy	1.00 0.90
DpwB: Deepwood-----	82	Not limited		Not limited		Not limited	
DpwC: Deepwood-----	79	Not limited		Not limited		Somewhat limited Slope	0.50
DpwD: Deepwood-----	90	Not limited		Not limited		Very limited Slope	1.00
DpwE: Deepwood-----	89	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00
DvlB: Devol-----	83	Not limited		Not limited		Not limited	
DvlC: Devol-----	93	Not limited		Not limited		Somewhat limited Slope	0.50
DvlD: Devol-----	90	Not limited		Not limited		Very limited Slope	1.00
EdlC: Eda-----	86	Somewhat limited Too sandy	0.42	Somewhat limited Too sandy	0.42	Somewhat limited Too sandy Slope	0.42 0.12
EdlE: Eda-----	75	Somewhat limited Too sandy Slope	0.42 0.04	Somewhat limited Too sandy Slope	0.42 0.04	Very limited Slope Too sandy	1.00 0.42
FayB: Farry-----	93	Not limited		Not limited		Not limited	
FayC: Farry-----	100	Not limited		Not limited		Somewhat limited Slope	0.50

Table 11a.--Recreation, Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FoFE: Fortyone-----	70	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope Gravel content	1.00 0.06
Farry-----	30	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope	1.00
FrkA: Frankirk-----	77	Not limited		Not limited		Not limited	
FrkB: Frankirk-----	85	Not limited		Not limited		Not limited	
FtnB: Fortyone-----	90	Not limited		Not limited		Somewhat limited Gravel content	0.06
FtnC: Fortyone-----	100	Not limited		Not limited		Somewhat limited Slope Gravel content	0.50 0.06
FtnD: Fortyone-----	90	Not limited		Not limited		Very limited Slope Gravel content	1.00 0.06
GcsA: Gracemore-----	85	Very limited Depth to saturated zone Flooding	1.00 1.00	Somewhat limited Depth to saturated zone	0.90	Very limited Depth to saturated zone	1.00
GdfB: Grandfield----	94	Not limited		Not limited		Not limited	
GdfC: Grandfield----	92	Not limited		Not limited		Somewhat limited Slope	0.50
GDGE: Grandfield----	48	Not limited		Not limited		Very limited Slope	1.00
Devol-----	32	Not limited		Not limited		Very limited Slope	1.00
Grandmore-----	20	Not limited		Not limited		Not limited	
GdmB: Grandmore-----	86	Not limited		Not limited		Not limited	
GfsA: Gracemore-----	100	Very limited Depth to saturated zone Flooding Salinity	1.00 1.00 1.00	Very limited Salinity Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Salinity Flooding	1.00 1.00 0.60

Table 11a.--Recreation, Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GmrA: Gracemont-----	91	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
GmsA: Gracemont-----	100	Very limited Depth to saturated zone Flooding Salinity	1.00 1.00 1.00	Very limited Salinity Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Salinity	1.00 1.00
GrmA: Gracemore-----	95	Very limited Depth to saturated zone Flooding Salinity	1.00 1.00 1.00	Very limited Salinity Depth to saturated zone	1.00 0.90	Very limited Depth to saturated zone Salinity	1.00 1.00
HdGB: Hardeman-----	60	Somewhat limited Too sandy	0.82	Somewhat limited Too sandy	0.82	Somewhat limited Too sandy	0.82
Grandmore-----	40	Not limited		Not limited		Not limited	
HdGC: Hardeman-----	70	Not limited		Not limited		Somewhat limited Slope	0.50
Grandmore-----	25	Not limited		Not limited		Somewhat limited Slope	0.50
HdmB: Hardeman-----	85	Not limited		Not limited		Not limited	
HdmC: Hardeman-----	90	Not limited		Not limited		Somewhat limited Slope	0.50
IreA: Irene-----	97	Not limited		Not limited		Not limited	
IreB: Irene-----	100	Not limited		Not limited		Not limited	
IreC: Irene-----	100	Not limited		Not limited		Somewhat limited Slope	0.50
IreD: Irene-----	100	Not limited		Not limited		Very limited Slope	1.00
JssF: Jester-----	100	Very limited Too sandy Slope	1.00 0.04	Very limited Too sandy Slope	1.00 0.04	Very limited Too sandy Slope	1.00 1.00

Table 11a.--Recreation, Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
JstC: Jester-----	94	Somewhat limited Too sandy	0.87	Somewhat limited Too sandy	0.87	Somewhat limited Too sandy Slope	0.87 0.12
KidB: Kingsdown----	100	Not limited		Not limited		Not limited	
KiHE: Kingsdown----	60	Not limited		Not limited		Very limited Slope	1.00
Hardeman-----	35	Not limited		Not limited		Very limited Slope	1.00
LgtA: Lugert-----	100	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
LiJC: Lincoln-----	51	Very limited Flooding	1.00	Not limited		Not limited	
Jester-----	49	Very limited Flooding Too sandy	1.00 0.87	Somewhat limited Too sandy	0.87	Somewhat limited Too sandy Slope	0.87 0.12
LikB: Likes-----	100	Not limited		Not limited		Not limited	
LisA: Lincoln-----	100	Very limited Flooding Too sandy	1.00 1.00	Very limited Too sandy Flooding	1.00 0.40	Very limited Too sandy Flooding	1.00 1.00
LncA: Lincoln-----	100	Very limited Flooding	1.00	Not limited		Not limited	
LroE: Laverne-----	70	Very limited Depth to cemented pan	1.00	Very limited Depth to cemented pan	1.00	Very limited Depth to cemented pan Slope Gravel content	1.00 1.00 0.04
Rock outcrop--	20	Not rated		Not rated		Not rated	
LshA: Lesho-----	83	Very limited Flooding	1.00	Not limited		Not limited	
LsoA: Lincoln-----	83	Very limited Flooding Too sandy	1.00 1.00	Very limited Too sandy	1.00	Very limited Too sandy Flooding	1.00 0.60
M-W: Water-----	100	Not rated		Not rated		Not rated	

Table 11a.--Recreation, Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
<b>MLBB:</b>							
Mobeetie-----	45	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50
Likes-----	22	Somewhat limited Too sandy	0.91	Somewhat limited Too sandy	0.91	Somewhat limited Too sandy	0.91
Berda-----	21	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50
<b>MLBC:</b>							
Mobeetie-----	45	Not limited		Not limited		Somewhat limited Slope	0.50
Likes-----	22	Not limited		Not limited		Somewhat limited Slope	0.50
Berda-----	21	Not limited		Not limited		Somewhat limited Slope	0.50
<b>MLBE:</b>							
Mobeetie-----	45	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope	1.00
Likes-----	22	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope	1.00
Berda-----	21	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope	1.00
<b>MnsB:</b>							
Mansic-----	94	Not limited		Not limited		Not limited	
<b>MnsC:</b>							
Mansic-----	100	Not limited		Not limited		Somewhat limited Slope	0.50
<b>MsnB:</b>							
Manson-----	95	Not limited		Not limited		Not limited	
<b>MsnC:</b>							
Manson-----	100	Not limited		Not limited		Somewhat limited Slope	0.50
<b>MsnC2:</b>							
Manson-----	95	Not limited		Not limited		Somewhat limited Slope	0.50
<b>OMBE:</b>							
Oklark-----	43	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope	1.00
Mansic-----	27	Somewhat limited Dusty Slope	0.50 0.04	Somewhat limited Dusty Slope	0.50 0.04	Very limited Slope Dusty	1.00 0.50
Berda-----	23	Somewhat limited Dusty Slope	0.50 0.04	Somewhat limited Dusty Slope	0.50 0.04	Very limited Slope Dusty	1.00 0.50

Table 11a.--Recreation, Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
OMBG:							
Oklark-----	33	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Mansic-----	26	Very limited Slope Dusty	1.00 0.50	Very limited Slope Dusty	1.00 0.50	Very limited Slope Dusty	1.00 0.50
Berda-----	25	Very limited Slope Dusty	1.00 0.50	Very limited Slope Dusty	1.00 0.50	Very limited Slope Dusty	1.00 0.50
PdoA:							
Paloduro-----	100	Not limited		Not limited		Not limited	
PdoB:							
Paloduro-----	100	Not limited		Not limited		Not limited	
PdoC2:							
Paloduro-----	90	Not limited		Not limited		Somewhat limited Slope	0.50
PIT:							
Pits-----	100	Not rated		Not rated		Not rated	
PlmB:							
Plemons-----	100	Not limited		Not limited		Not limited	
PlmC:							
Plemons-----	100	Not limited		Not limited		Somewhat limited Slope	0.50
PlmD:							
Plemons-----	90	Not limited		Not limited		Very limited Slope	1.00
QnWC3:							
Quinlan-----	67	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope	1.00 0.50
Woodward-----	33	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.50 0.46
QnWD:							
Quinlan-----	48	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope	1.00 1.00
Woodward-----	30	Not limited		Not limited		Very limited Slope Depth to bedrock	1.00 0.84
QnWE:							
Quinlan-----	72	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Slope	1.00 1.00



Table 11a.--Recreation, Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
QnWE: Woodward-----	24	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope Depth to bedrock	1.00 0.97
QRWG: Quinlan-----	50	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to bedrock Slope	1.00 1.00
Rock outcrop--	33	Not rated		Not rated		Not rated	
Woodward-----	17	Somewhat limited Slope	0.84	Somewhat limited Slope	0.84	Very limited Slope Depth to bedrock	1.00 0.97
QRYG: Quinlan-----	41	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to bedrock Slope	1.00 1.00
Rock outcrop--	18	Not rated		Not rated		Not rated	
Yomont-----	17	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
QWDE: Quinlan-----	41	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Slope	1.00 1.00
Woodward-----	38	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope Depth to bedrock	1.00 0.84
Deepwood-----	12	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope	1.00
QWRC: Quinlan-----	58	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope	1.00 0.12
Woodward-----	23	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.12 0.01
Rock outcrop--	10	Not rated		Not rated		Not rated	
RoCH: Rock outcrop--	55	Not rated		Not rated		Not rated	
Cottonwood----	30	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Slope Depth to bedrock	1.00 1.00

Table 11a.--Recreation, Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RssA: Rosston-----	100	Very limited Depth to saturated zone Ponding Too clayey Restricted permeability	1.00 1.00 0.50 0.45	Very limited Depth to saturated zone Ponding Too clayey Restricted permeability	1.00 1.00 0.50 0.45	Very limited Depth to saturated zone Ponding Too clayey Restricted permeability	1.00 1.00 0.50 0.45
SAL: Salt flats----	100	Not rated		Not rated		Not rated	
SelA: Selman-----	96	Not limited		Not limited		Not limited	
SelB: Selman-----	92	Not limited		Not limited		Not limited	
SelC: Selman-----	87	Not limited		Not limited		Somewhat limited Slope	0.50
SelC2: Selman-----	100	Not limited		Not limited		Somewhat limited Slope	0.50
SelD: Selman-----	94	Not limited		Not limited		Very limited Slope	1.00
SelD2: Selman-----	81	Not limited		Not limited		Very limited Slope	1.00
SprA: Spur-----	87	Very limited Flooding	1.00	Not limited		Not limited	
SpsA: Spur-----	100	Very limited Flooding Salinity	1.00 0.50	Somewhat limited Salinity	0.50	Somewhat limited Salinity	0.50
StpA: St. Paul-----	92	Not limited		Not limited		Not limited	
StpB: St. Paul-----	93	Not limited		Not limited		Not limited	
StpC: St. Paul-----	95	Not limited		Not limited		Somewhat limited Slope	0.50
StpD: St. Paul-----	96	Not limited		Not limited		Very limited Slope	1.00

Table 11a.--Recreation, Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TeWE: Teagard-----	53	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Slope Depth to bedrock Restricted permeability	0.88 0.46 0.45
Wellsford----	33	Very limited Depth to bedrock Restricted permeability	1.00 0.45	Very limited Depth to bedrock Restricted permeability	1.00 0.45	Very limited Depth to bedrock Slope Restricted permeability	1.00 1.00 0.45
TexA: Texroy-----	100	Not limited		Not limited		Not limited	
TexB: Texroy-----	100	Not limited		Not limited		Not limited	
TexC: Texroy-----	100	Not limited		Not limited		Somewhat limited Slope	0.50
TipA: Tipton-----	95	Not limited		Not limited		Not limited	
TipB: Tipton-----	100	Not limited		Not limited		Not limited	
TipC: Tipton-----	100	Not limited		Not limited		Somewhat limited Slope	0.50
TipD: Tipton-----	87	Not limited		Not limited		Very limited Slope	1.00
TRQC: Talpa-----	53	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope	1.00 0.12
Rock outcrop--	25	Not rated		Not rated		Not rated	
Quinlan-----	22	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope	1.00 0.12
TvlC: Tivoli-----	85	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Very limited Too sandy Slope	1.00 0.12
TvlE: Tivoli-----	88	Very limited Too sandy Slope	1.00 0.04	Very limited Too sandy Slope	1.00 0.04	Very limited Too sandy Slope	1.00 1.00

Table 11a.--Recreation, Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TvlG: Tivoli-----	97	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Too sandy	1.00 1.00
VerB: Vernon-----	75	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45
VerC: Vernon-----	69	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Slope Restricted permeability Depth to bedrock	0.50 0.45 0.10
VerD: Vernon-----	80	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Very limited Slope Depth to bedrock Restricted permeability	1.00 0.80 0.45
VrrB: Vernon-----	86	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45
VrrC: Vernon-----	76	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Slope Restricted permeability Depth to bedrock	0.50 0.45 0.03
W: Water-----	100	Not rated		Not rated		Not rated	
WodA: Woods-----	80	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45
WodB: Woods-----	86	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45
WodC: Woods-----	100	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Slope Restricted permeability	0.50 0.45

Table 11a.--Recreation, Part I--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WQHE:							
Westola-----	48	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
Quinlan-----	30	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope	1.00 1.00
Hardeman-----	22	Not limited		Not limited		Very limited Slope	1.00
WQnB:							
Woodward-----	45	Not limited		Not limited		Not limited	
Quinlan-----	43	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
WQnC:							
Woodward-----	56	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.50 0.46
Quinlan-----	22	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope	1.00 0.50
WslA:							
Westola-----	75	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
WstA:							
Westola-----	88	Very limited Flooding	1.00	Not limited		Not limited	
YmrA:							
Yomont-----	100	Very limited Flooding	1.00	Not limited		Not limited	
YmtA:							
Yomont-----	94	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60

Table 11b.--Recreation, Part II

[The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table]

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AbbA: Abbie-----	100	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Not limited	
AbbB: Abbie-----	95	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Not limited	
AbbB2: Abbie-----	100	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Not limited	
AbbC: Abbie-----	95	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Not limited	
AbbC2: Abbie-----	100	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Not limited	
AbsB: Abilene-----	85	Not limited		Not limited		Not limited	
AclA: Abbie-----	87	Not limited		Not limited		Not limited	
AflB: Abbie-----	100	Not limited		Not limited		Not limited	
AflC: Abbie-----	100	Not limited		Not limited		Not limited	
BdaB: Berda-----	84	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Not limited	
BdaC: Berda-----	80	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Not limited	
BdaD: Berda-----	100	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Not limited	
CRVE: Cottonwood----	37	Not limited		Not limited		Very limited Depth to bedrock Droughty	1.00 1.00
Rock outcrop--	28	Not rated		Not rated		Not rated	
Vinson-----	12	Not limited		Not limited		Somewhat limited Depth to bedrock	0.16

Table 11b.--Recreation, Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DAM: Dam-----	100	Not rated		Not rated		Not rated	
DevE: Devol-----	100	Somewhat limited Too sandy	0.90	Somewhat limited Too sandy	0.90	Somewhat limited Slope	0.16
DpwB: Deepwood-----	82	Not limited		Not limited		Not limited	
DpwC: Deepwood-----	79	Not limited		Not limited		Not limited	
DpwD: Deepwood-----	90	Not limited		Not limited		Not limited	
DpwE: Deepwood-----	89	Very limited Water erosion	1.00	Very limited Water erosion	1.00	Somewhat limited Slope	0.16
DvlB: Devol-----	83	Not limited		Not limited		Not limited	
DvlC: Devol-----	93	Not limited		Not limited		Not limited	
DvlD: Devol-----	90	Not limited		Not limited		Not limited	
EdlC: Eda-----	86	Somewhat limited Too sandy	0.42	Somewhat limited Too sandy	0.42	Somewhat limited Droughty	0.57
EdlE: Eda-----	75	Somewhat limited Too sandy	0.42	Somewhat limited Too sandy	0.42	Somewhat limited Droughty Slope	0.52 0.04
FayB: Farry-----	93	Not limited		Not limited		Not limited	
FayC: Farry-----	100	Not limited		Not limited		Not limited	
FoFE: Fortyone-----	70	Not limited		Not limited		Somewhat limited Slope Droughty	0.04 0.01
Farry-----	30	Not limited		Not limited		Somewhat limited Slope	0.04
FrkA: Frankirk-----	77	Not limited		Not limited		Not limited	
FrkB: Frankirk-----	85	Not limited		Not limited		Not limited	

Table 11b.--Recreation, Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FtnB: Fortyone-----	90	Not limited		Not limited		Somewhat limited Droughty	0.06
FtnC: Fortyone-----	100	Not limited		Not limited		Not limited	
FtnD: Fortyone-----	90	Not limited		Not limited		Not limited	
GcsA: Gracemore-----	85	Somewhat limited Depth to saturated zone	0.78	Somewhat limited Depth to saturated zone	0.78	Somewhat limited Depth to saturated zone	0.90
GdfB: Grandfield----	94	Not limited		Not limited		Not limited	
GdfC: Grandfield----	92	Not limited		Not limited		Not limited	
GDGE: Grandfield----	48	Not limited		Not limited		Not limited	
Devol-----	32	Not limited		Not limited		Not limited	
Grandmore-----	20	Not limited		Not limited		Not limited	
GdmB: Grandmore-----	86	Not limited		Not limited		Not limited	
GfsA: Gracemore-----	100	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Salinity Depth to saturated zone Flooding Droughty	1.00 1.00 0.60 0.48
GmrA: Gracemont-----	91	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
GmsA: Gracemont-----	100	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Salinity Depth to saturated zone	1.00 1.00
GrmA: Gracemore-----	95	Somewhat limited Depth to saturated zone	0.78	Somewhat limited Depth to saturated zone	0.78	Very limited Salinity Depth to saturated zone	1.00 0.90



Table 11b.--Recreation, Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HdGB:							
Hardeman-----	60	Somewhat limited Too sandy	0.82	Somewhat limited Too sandy	0.82	Not limited	
Grandmore-----	40	Not limited		Not limited		Not limited	
HdGC:							
Hardeman-----	70	Not limited		Not limited		Not limited	
Grandmore-----	25	Not limited		Not limited		Not limited	
HdmB:							
Hardeman-----	85	Not limited		Not limited		Not limited	
HdmC:							
Hardeman-----	90	Not limited		Not limited		Not limited	
IreA:							
Irene-----	97	Not limited		Not limited		Not limited	
IreB:							
Irene-----	100	Not limited		Not limited		Not limited	
IreC:							
Irene-----	100	Not limited		Not limited		Not limited	
IreD:							
Irene-----	100	Not limited		Not limited		Not limited	
JssF:							
Jester-----	100	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Very limited Droughty Too sandy Slope	0.99 0.50 0.04
JstC:							
Jester-----	94	Somewhat limited Too sandy	0.87	Somewhat limited Too sandy	0.87	Somewhat limited Droughty	0.96
KidB:							
Kingsdown-----	100	Not limited		Not limited		Not limited	
KiHE:							
Kingsdown-----	60	Not limited		Not limited		Not limited	
Hardeman-----	35	Not limited		Not limited		Not limited	
LgtA:							
Lugert-----	100	Not limited		Not limited		Somewhat limited Flooding	0.60
LiJC:							
Lincoln-----	51	Not limited		Not limited		Somewhat limited Droughty	0.61
Jester-----	49	Somewhat limited Too sandy	0.87	Somewhat limited Too sandy	0.87	Somewhat limited Droughty	0.97

Table 11b.--Recreation, Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LikB: Likes-----	100	Not limited		Not limited		Very limited Droughty	1.00
LisA: Lincoln-----	100	Very limited Too sandy Flooding	1.00 0.40	Very limited Too sandy Flooding	1.00 0.40	Very limited Flooding Droughty Too sandy	1.00 0.95 0.50
LncA: Lincoln-----	100	Not limited		Not limited		Somewhat limited Droughty	0.48
LroE: Laverne-----	70	Not limited		Not limited		Very limited Depth to cemented pan Droughty Carbonate content	1.00 1.00 1.00
Rock outcrop--	20	Not rated		Not rated		Not rated	
LshA: Lesho-----	83	Not limited		Not limited		Not limited	
LsoA: Lincoln-----	83	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Somewhat limited Droughty Flooding Too sandy	0.84 0.60 0.50
M-W: Water-----	100	Not rated		Not rated		Not rated	
MLBB: Mobeetie-----	45	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Not limited	
Likes-----	22	Somewhat limited Too sandy	0.91	Somewhat limited Too sandy	0.91	Very limited Droughty	1.00
Berda-----	21	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Not limited	
MLBC: Mobeetie-----	45	Not limited		Not limited		Not limited	
Likes-----	22	Not limited		Not limited		Very limited Droughty	1.00
Berda-----	21	Not limited		Not limited		Not limited	
MLBE: Mobeetie-----	45	Not limited		Not limited		Somewhat limited Slope	0.04

Table 11b.--Recreation, Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MLBE:							
Likes-----	22	Not limited		Not limited		Very limited Droughty Slope	1.00 0.04
Berda-----	21	Not limited		Not limited		Somewhat limited Slope	0.04
MnsB:							
Mansic-----	94	Not limited		Not limited		Not limited	
MnsC:							
Mansic-----	100	Not limited		Not limited		Not limited	
MsnB:							
Manson-----	95	Not limited		Not limited		Not limited	
MsnC:							
Manson-----	100	Not limited		Not limited		Not limited	
MsnC2:							
Manson-----	95	Not limited		Not limited		Not limited	
OMBE:							
Oklark-----	43	Not limited		Not limited		Somewhat limited Slope	0.04
Mansic-----	27	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Somewhat limited Slope	0.04
Berda-----	23	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Somewhat limited Slope	0.04
OMBG:							
Oklark-----	33	Somewhat limited Slope	0.92	Not limited		Very limited Slope	1.00
Mansic-----	26	Very limited Water erosion Slope Dusty	1.00 0.92 0.50	Very limited Water erosion Dusty	1.00 0.50	Very limited Slope	1.00
Berda-----	25	Very limited Slope Dusty	1.00 0.50	Somewhat limited Slope Dusty	0.56 0.50	Very limited Slope	1.00
PdoA:							
Paloduro-----	100	Not limited		Not limited		Not limited	
PdoB:							
Paloduro-----	100	Not limited		Not limited		Not limited	
PdoC2:							
Paloduro-----	90	Not limited		Not limited		Not limited	
PIT:							
Pits-----	100	Not rated		Not rated		Not rated	
PlmB:							
Plemons-----	100	Not limited		Not limited		Not limited	

Table 11b.--Recreation, Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PlmC: Plemons-----	100	Not limited		Not limited		Not limited	
PlmD: Plemons-----	90	Not limited		Not limited		Not limited	
QnWC3: Quinlan-----	67	Not limited		Not limited		Very limited Depth to bedrock Droughty	1.00 1.00
Woodward-----	33	Not limited		Not limited		Somewhat limited Depth to bedrock	0.46
QnWD: Quinlan-----	48	Not limited		Not limited		Very limited Depth to bedrock Droughty	1.00 0.84
Woodward-----	30	Not limited		Not limited		Somewhat limited Depth to bedrock	0.84
QnWE: Quinlan-----	72	Very limited Water erosion	1.00	Very limited Water erosion	1.00	Very limited Depth to bedrock Droughty Slope	1.00 0.46 0.04
Woodward-----	24	Very limited Water erosion	1.00	Very limited Water erosion	1.00	Somewhat limited Depth to bedrock Slope	0.97 0.04
QRWG: Quinlan-----	50	Very limited Slope Water erosion	1.00 1.00	Very limited Water erosion	1.00	Very limited Depth to bedrock Slope Droughty	1.00 1.00 0.93
Rock outcrop--	33	Not rated		Not rated		Not rated	
Woodward-----	17	Very limited Water erosion	1.00	Very limited Water erosion	1.00	Somewhat limited Depth to bedrock Slope	0.97 0.84
QRYG: Quinlan-----	41	Very limited Water erosion Slope	1.00 0.92	Very limited Water erosion	1.00	Very limited Depth to bedrock Slope Droughty	1.00 1.00 0.85
Rock outcrop--	18	Not rated		Not rated		Not rated	
Yomont-----	17	Somewhat limited Flooding	0.40	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
QWDE: Quinlan-----	41	Very limited Water erosion	1.00	Very limited Water erosion	1.00	Very limited Depth to bedrock Droughty Slope	1.00 0.84 0.04

Table 11b.--Recreation, Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
QWDE: Woodward-----	38	Very limited Water erosion	1.00	Very limited Water erosion	1.00	Somewhat limited Depth to bedrock Slope	0.84 0.04
Deepwood-----	12	Very limited Water erosion	1.00	Very limited Water erosion	1.00	Somewhat limited Slope	0.04
QWRC: Quinlan-----	58	Not limited		Not limited		Very limited Depth to bedrock Droughty	1.00 0.96
Woodward-----	23	Not limited		Not limited		Somewhat limited Depth to bedrock	0.01
Rock outcrop--	10	Not rated		Not rated		Not rated	
RoCH: Rock outcrop--	55	Not rated		Not rated		Not rated	
Cottonwood----	30	Somewhat limited Slope	0.02	Not limited		Very limited Depth to bedrock Droughty Slope	1.00 1.00 1.00
RssA: Rosston-----	100	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Too clayey Depth to saturated zone Ponding	1.00 1.00 1.00
SAL: Salt flats----	100	Not rated		Not rated		Not rated	
SelA: Selman-----	96	Not limited		Not limited		Not limited	
SelB: Selman-----	92	Not limited		Not limited		Not limited	
SelC: Selman-----	87	Not limited		Not limited		Not limited	
SelC2: Selman-----	100	Not limited		Not limited		Not limited	
SelD: Selman-----	94	Not limited		Not limited		Not limited	
SelD2: Selman-----	81	Not limited		Not limited		Not limited	
SprA: Spur-----	87	Not limited		Not limited		Not limited	
SpsA: Spur-----	100	Not limited		Not limited		Somewhat limited Salinity	0.50

Table 11b.--Recreation, Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
StpA: St. Paul-----	92	Not limited		Not limited		Not limited	
StpB: St. Paul-----	93	Not limited		Not limited		Not limited	
StpC: St. Paul-----	95	Not limited		Not limited		Not limited	
StpD: St. Paul-----	96	Not limited		Not limited		Not limited	
TeWE: Teagard-----	53	Not limited		Not limited		Somewhat limited Depth to bedrock	0.46
Wellsford----	33	Not limited		Not limited		Very limited Depth to bedrock Droughty	1.00 1.00
TexA: Texroy-----	100	Not limited		Not limited		Not limited	
TexB: Texroy-----	100	Not limited		Not limited		Not limited	
TexC: Texroy-----	100	Not limited		Not limited		Not limited	
TipA: Tipton-----	95	Not limited		Not limited		Not limited	
TipB: Tipton-----	100	Not limited		Not limited		Not limited	
TipC: Tipton-----	100	Not limited		Not limited		Not limited	
TipD: Tipton-----	87	Not limited		Not limited		Not limited	
TRQC: Talpa-----	53	Not limited		Not limited		Very limited Depth to bedrock Droughty	1.00 1.00
Rock outcrop--	25	Not rated		Not rated		Not rated	
Quinlan-----	22	Not limited		Not limited		Very limited Depth to bedrock Droughty	1.00 0.85
Tv1C: Tivoli-----	85	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Somewhat limited Droughty	0.96
Tv1E: Tivoli-----	88	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Somewhat limited Droughty Slope	0.86 0.04

Table 11b.--Recreation, Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Tv1G: Tivoli-----	97	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 0.14	Very limited Slope Droughty	1.00 0.95
VerB: Vernon-----	75	Not limited		Not limited		Somewhat limited Depth to bedrock	0.16
VerC: Vernon-----	69	Not limited		Not limited		Somewhat limited Depth to bedrock	0.10
VerD: Vernon-----	80	Not limited		Not limited		Somewhat limited Depth to bedrock Droughty	0.80 0.12
VrrB: Vernon-----	86	Not limited		Not limited		Somewhat limited Depth to bedrock	0.01
VrrC: Vernon-----	76	Not limited		Not limited		Somewhat limited Depth to bedrock	0.03
W: Water-----	100	Not rated		Not rated		Not rated	
WodA: Woods-----	80	Not limited		Not limited		Not limited	
WodB: Woods-----	86	Not limited		Not limited		Not limited	
WodC: Woods-----	100	Not limited		Not limited		Not limited	
WQHE: Westola-----	48	Not limited		Not limited		Somewhat limited Flooding	0.60
Quinlan-----	30	Not limited		Not limited		Very limited Depth to bedrock Droughty	1.00 0.78
Hardeman-----	22	Not limited		Not limited		Not limited	
WQnB: Woodward-----	45	Not limited		Not limited		Somewhat limited Depth to bedrock	0.84
Quinlan-----	43	Not limited		Not limited		Very limited Depth to bedrock Droughty	1.00 0.46

Table 11b.--Recreation, Part II--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WQnC: Woodward-----	56	Not limited		Not limited		Somewhat limited Depth to bedrock	0.46
Quinlan-----	22	Not limited		Not limited		Very limited Depth to bedrock Droughty	1.00 0.93
WslA: Westola-----	75	Not limited		Not limited		Somewhat limited Flooding	0.60
WstA: Westola-----	88	Not limited		Not limited		Not limited	
YmrA: Yomont-----	100	Not limited		Not limited		Not limited	
YmtA: Yomont-----	94	Not limited		Not limited		Somewhat limited Flooding	0.60



## Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for sanitary facilities, waste management, building site development, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the “Soil Properties” section.

*Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.*

*The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.*

*Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.*

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

## Sanitary Facilities

Tables 12a and 12b show the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates

that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

*Septic tank absorption fields* are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

*Sewage lagoons* are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A *trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and

sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an *area sanitary landfill*, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

*Daily cover for landfill* is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Table 12a.--Sanitary Facilities, Part I

[The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table]

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AbbA: Abbie-----	100	Very limited Restricted permeability	1.00	Very limited Seepage	1.00
AbbB: Abbie-----	95	Very limited Restricted permeability	1.00	Very limited Seepage	1.00
AbbB2: Abbie-----	100	Very limited Restricted permeability	1.00	Very limited Seepage	1.00
AbbC: Abbie-----	95	Very limited Restricted permeability	1.00	Very limited Seepage Slope	1.00 0.32
AbbC2: Abbie-----	100	Very limited Restricted permeability	1.00	Very limited Seepage Slope	1.00 0.32
AbsB: Abilene-----	85	Very limited Restricted permeability	1.00	Somewhat limited Seepage	0.53
AclA: Abbie-----	87	Very limited Restricted permeability	1.00	Not limited	
AflB: Abbie-----	100	Not limited		Very limited Seepage	1.00
AflC: Abbie-----	100	Very limited Restricted permeability	1.00	Very limited Seepage Slope	1.00 0.32
BdaB: Berda-----	84	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage	0.53
BdaC: Berda-----	80	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage Slope	0.53 0.32

Table 12a.--Sanitary Facilities, Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
BdaD: Berda-----	100	Somewhat limited Restricted permeability	0.46	Very limited Slope Seepage	1.00 0.53
CRVE: Cottonwood-----	37	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
Rock outcrop-----	28	Not rated		Not rated	
Vinson-----	12	Very limited Depth to bedrock Restricted permeability	1.00 0.46	Very limited Depth to soft bedrock Seepage Slope	1.00 0.53 0.32
DAM: Dam-----	100	Not rated		Not rated	
DevE: Devol-----	100	Somewhat limited Slope	0.16	Very limited Slope Seepage	1.00 1.00
DpwB: Deepwood-----	82	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage	0.53
DpwC: Deepwood-----	79	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage Slope	0.53 0.32
DpwD: Deepwood-----	90	Somewhat limited Restricted permeability	0.46	Very limited Slope Seepage	1.00 0.53
DpwE: Deepwood-----	89	Somewhat limited Restricted permeability Slope	0.46 0.16	Very limited Slope Seepage	1.00 0.53
DvlB: Devol-----	83	Not limited		Very limited Seepage	1.00
DvlC: Devol-----	93	Not limited		Very limited Seepage Slope	1.00 0.32

Table 12a.--Sanitary Facilities, Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Dv1D: Devol-----	90	Not limited		Very limited Seepage Slope	1.00 1.00
Ed1C: Eda-----	86	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
Ed1E: Eda-----	75	Very limited Filtering capacity Slope	1.00 0.04	Very limited Seepage Slope	1.00 1.00
FayB: Farry-----	93	Very limited Filtering capacity Restricted permeability	1.00 0.46	Very limited Seepage	1.00
FayC: Farry-----	100	Not limited		Very limited Seepage Slope	1.00 0.32
FoFE: Fortyone-----	70	Very limited Filtering capacity Slope	1.00 0.04	Very limited Seepage Slope	1.00 1.00
Farry-----	30	Very limited Filtering capacity Slope	1.00 0.04	Very limited Seepage Slope	1.00 1.00
FrkA: Frankirk-----	77	Very limited Restricted permeability	1.00	Somewhat limited Seepage	0.53
FrkB: Frankirk-----	85	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage	0.53
FtnB: Fortyone-----	90	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
FtnC: Fortyone-----	100	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.32

Table 12a.--Sanitary Facilities, Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
FtnD: Fortyone-----	90	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 1.00
GcsA: Gracemore-----	85	Very limited Depth to saturated zone Filtering capacity Restricted permeability Flooding	1.00 1.00 0.46 0.40	Very limited Seepage Depth to saturated zone Flooding	1.00 1.00 0.40
GdfB: Grandfield-----	94	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage	0.53
GdfC: Grandfield-----	92	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage Slope	0.53 0.32
GDGE: Grandfield-----	48	Somewhat limited Restricted permeability	0.46	Very limited Seepage Slope	1.00 0.92
Devol-----	32	Not limited		Very limited Seepage Slope	1.00 1.00
Grandmore-----	20	Very limited Restricted permeability	1.00	Somewhat limited Seepage	0.53
GdmB: Grandmore-----	86	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage	0.53
GfsA: Gracemore-----	100	Very limited Flooding Depth to saturated zone Filtering capacity	1.00 1.00 1.00	Very limited Flooding Seepage Depth to saturated zone	1.00 1.00 1.00
GmrA: Gracemont-----	91	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Seepage Flooding	1.00 1.00 0.40

Table 12a.--Sanitary Facilities, Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
GmsA: Gracemont-----	100	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Seepage Flooding	1.00 0.40
GrmA: Gracemore-----	95	Very limited Depth to saturated zone Filtering capacity Restricted permeability Flooding	1.00 1.00 0.46 0.40	Very limited Seepage Depth to saturated zone Flooding	1.00 1.00 0.40
HdGB: Hardeman-----	60	Not limited		Very limited Seepage	1.00
Grandmore-----	40	Very limited Restricted permeability	1.00	Somewhat limited Seepage	0.53
HdGC: Hardeman-----	70	Not limited		Very limited Seepage Slope	1.00 0.32
Grandmore-----	25	Very limited Restricted permeability	1.00	Somewhat limited Seepage Slope	0.53 0.32
HdmB: Hardeman-----	85	Not limited		Very limited Seepage	1.00
HdmC: Hardeman-----	90	Not limited		Very limited Seepage Slope	1.00 0.32
IreA: Irene-----	97	Very limited Restricted permeability	1.00	Somewhat limited Seepage	0.53
IreB: Irene-----	100	Very limited Restricted permeability	1.00	Not limited	
IreC: Irene-----	100	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.32



Table 12a.--Sanitary Facilities, Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
IreD: Irene-----	100	Very limited Restricted permeability	1.00	Somewhat limited Slope Seepage	0.98 0.53
JssF: Jester-----	100	Very limited Filtering capacity Slope	1.00 0.04	Very limited Seepage Slope	1.00 1.00
JstC: Jester-----	94	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
KidB: Kingsdown-----	100	Not limited		Very limited Seepage	1.00
KiHE: Kingsdown-----	60	Not limited		Very limited Seepage Slope	1.00 0.92
Hardeman-----	35	Not limited		Very limited Seepage Slope	1.00 1.00
LgtA: Lugert-----	100	Very limited Flooding Restricted permeability	1.00 0.46	Very limited Flooding Seepage	1.00 0.53
LiJC: Lincoln-----	51	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Flooding	1.00 0.40
Jester-----	49	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Flooding Slope	1.00 0.40 0.08
LikB: Likes-----	100	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
LisA: Lincoln-----	100	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage	1.00 1.00

Table 12a.--Sanitary Facilities, Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
LncA: Lincoln-----	100	Very limited Filtering capacity Flooding	1.00 0.40	Very limited Seepage Flooding	1.00 0.40
LROE: Laverne-----	70	Very limited Depth to cemented pan	1.00	Very limited Depth to cemented pan Slope Seepage	1.00 1.00 0.53
Rock outcrop-----	20	Not rated		Not rated	
LshA: Lesho-----	83	Very limited Depth to saturated zone Filtering capacity Restricted permeability Flooding	1.00 1.00 1.00 0.40	Very limited Seepage Depth to saturated zone Flooding	1.00 1.00 0.40
LsoA: Lincoln-----	83	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage	1.00 1.00
M-W: Water-----	100	Not rated		Not rated	
MLBB: Mobeetie-----	45	Not limited		Very limited Seepage	1.00
Likes-----	22	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
Berda-----	21	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage	0.53
MLBC: Mobeetie-----	45	Not limited		Very limited Seepage Slope	1.00 0.32
Likes-----	22	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.32
Berda-----	21	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage Slope	0.53 0.32

Table 12a.--Sanitary Facilities, Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
<b>MLBE:</b>					
Mobeetie-----	45	Somewhat limited Slope	0.04	Very limited Seepage Slope	1.00 1.00
Likes-----	22	Very limited Filtering capacity Slope	1.00 0.04	Very limited Seepage Slope	1.00 1.00
Berda-----	21	Somewhat limited Restricted permeability Slope	0.46 0.04	Very limited Slope Seepage	1.00 0.53
<b>MnsB:</b>					
Mansic-----	94	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage	0.53
<b>MnsC:</b>					
Mansic-----	100	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage Slope	0.53 0.32
<b>MsnB:</b>					
Manson-----	95	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage	0.53
<b>MsnC:</b>					
Manson-----	100	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage Slope	0.53 0.32
<b>MsnC2:</b>					
Manson-----	95	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage Slope	0.53 0.32
<b>OMBE:</b>					
Oklark-----	43	Somewhat limited Slope	0.04	Very limited Seepage Slope	1.00 1.00
Mansic-----	27	Somewhat limited Restricted permeability Slope	0.46 0.04	Very limited Slope Seepage	1.00 1.00
Berda-----	23	Somewhat limited Restricted permeability Slope	0.46 0.04	Very limited Slope Seepage	1.00 0.53
<b>OMBG:</b>					
Oklark-----	33	Very limited Slope	1.00	Very limited Slope Seepage	1.00 1.00

Table 12a.--Sanitary Facilities, Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
OMBG: Mansic-----	26	Very limited Slope Restricted permeability	1.00 0.46	Very limited Slope Seepage	1.00 1.00
Berda-----	25	Very limited Slope Restricted permeability	1.00 0.46	Very limited Slope Seepage	1.00 0.53
PdoA: Paloduro-----	100	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage	0.53
PdoB: Paloduro-----	100	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage	0.53
PdoC2: Paloduro-----	90	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage Slope	0.53 0.32
PIT: Pits-----	100	Not rated		Not rated	
PlmB: Plemons-----	100	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage	0.53
PlmC: Plemons-----	100	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage Slope	0.53 0.32
PlmD: Plemons-----	90	Somewhat limited Restricted permeability	0.46	Very limited Slope Seepage	1.00 0.53
QnWC3: Quinlan-----	67	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Slope	1.00 0.32
Woodward-----	33	Very limited Depth to bedrock Restricted permeability	1.00 0.46	Very limited Depth to soft bedrock Seepage Slope	1.00 0.53 0.32

Table 12a.--Sanitary Facilities, Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
QnWD: Quinlan-----	48	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 1.00
Woodward-----	30	Very limited Depth to bedrock Restricted permeability	1.00 0.46	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 0.53
QnWE: Quinlan-----	72	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 1.00
Woodward-----	24	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 0.53
QRWG: Quinlan-----	50	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 1.00
Rock outcrop-----	33	Not rated		Not rated	
Woodward-----	17	Very limited Depth to bedrock Slope	1.00 0.84	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 0.53
QRYG: Quinlan-----	41	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 1.00
Rock outcrop-----	18	Not rated		Not rated	
Yomont-----	17	Very limited Flooding	1.00	Very limited Flooding Seepage	1.00 1.00
QWDE: Quinlan-----	41	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 1.00

Table 12a.--Sanitary Facilities, Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
QWDE:					
Woodward-----	38	Very limited Depth to bedrock Restricted permeability Slope	1.00 0.46 0.04	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 0.53
Deepwood-----	12	Somewhat limited Restricted permeability Slope	0.46 0.04	Very limited Slope Seepage	1.00 0.53
QWRC:					
Quinlan-----	58	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Seepage Slope	1.00 1.00 0.08
Woodward-----	23	Very limited Depth to bedrock Restricted permeability	1.00 0.46	Very limited Depth to soft bedrock Seepage Slope	1.00 0.53 0.08
Rock outcrop-----	10	Not rated		Not rated	
RoCH:					
Rock outcrop-----	55	Not rated		Not rated	
Cottonwood-----	30	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 1.00
RssA:					
Rosston-----	100	Very limited Restricted permeability Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
SAL:					
Salt flats-----	100	Not rated		Not rated	
SelA:					
Selman-----	96	Somewhat limited Restricted permeability	0.72	Somewhat limited Seepage	0.53
SelB:					
Selman-----	92	Somewhat limited Restricted permeability	0.72	Somewhat limited Seepage	0.53

Table 12a.--Sanitary Facilities, Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
SelC: Selman-----	87	Somewhat limited Restricted permeability	0.72	Somewhat limited Seepage Slope	0.53 0.32
SelC2: Selman-----	100	Somewhat limited Restricted permeability	0.72	Somewhat limited Seepage Slope	0.53 0.32
SelD: Selman-----	94	Somewhat limited Restricted permeability	0.72	Very limited Slope Seepage	1.00 0.53
SelD2: Selman-----	81	Somewhat limited Restricted permeability	0.72	Very limited Slope Seepage	1.00 0.53
SprA: Spr-----	87	Somewhat limited Restricted permeability Flooding	0.46 0.40	Somewhat limited Seepage Flooding	0.53 0.40
SpsA: Spr-----	100	Somewhat limited Restricted permeability Flooding	0.46 0.40	Somewhat limited Seepage Flooding	0.53 0.40
StpA: St. Paul-----	92	Very limited Restricted permeability	1.00	Not limited	
StpB: St. Paul-----	93	Very limited Restricted permeability	1.00	Somewhat limited Seepage	0.28
StpC: St. Paul-----	95	Very limited Restricted permeability	1.00	Somewhat limited Seepage Slope	0.53 0.32
StpD: St. Paul-----	96	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.92
TeWE: Teagard-----	53	Very limited Restricted permeability Depth to bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 0.68

Table 12a.--Sanitary Facilities, Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
TeWE: Wellsford-----	33	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
TexA: Texroy-----	100	Somewhat limited Restricted permeability	0.72	Somewhat limited Seepage	0.53
TexB: Texroy-----	100	Somewhat limited Restricted permeability	0.72	Somewhat limited Seepage	0.53
TexC: Texroy-----	100	Somewhat limited Restricted permeability	0.72	Somewhat limited Seepage Slope	0.53 0.32
TipA: Tipton-----	95	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage	0.53
TipB: Tipton-----	100	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage	0.53
TipC: Tipton-----	100	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage Slope	0.53 0.32
TipD: Tipton-----	87	Somewhat limited Restricted permeability	0.46	Somewhat limited Slope Seepage	0.92 0.53
TRQC: Talpa-----	53	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock Seepage Slope	1.00 0.21 0.08
Rock outcrop-----	25	Not rated		Not rated	
Quinlan-----	22	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Seepage Slope	1.00 1.00 0.08



Table 12a.--Sanitary Facilities, Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Tv1C: Tivoli-----	85	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
Tv1E: Tivoli-----	88	Very limited Filtering capacity Slope	1.00 0.04	Very limited Seepage Slope	1.00 1.00
Tv1G: Tivoli-----	97	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
VerB: Vernon-----	75	Very limited Restricted permeability Depth to bedrock	1.00 1.00	Very limited Depth to soft bedrock	1.00
VerC: Vernon-----	69	Very limited Restricted permeability Depth to bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 0.32
VerD: Vernon-----	80	Very limited Restricted permeability Depth to bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
VrrB: Vernon-----	86	Very limited Restricted permeability Depth to bedrock	1.00 1.00	Very limited Depth to soft bedrock	1.00
VrrC: Vernon-----	76	Very limited Restricted permeability Depth to bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 0.32
W: Water-----	100	Not rated		Not rated	
WodA: Woods-----	80	Very limited Restricted permeability	1.00	Not limited	
WodB: Woods-----	86	Very limited Restricted permeability	1.00	Not limited	

Table 12a.--Sanitary Facilities, Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
WodC: Woods-----	100	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.32
WQHE: Westola-----	48	Very limited Flooding	1.00	Very limited Flooding Seepage	1.00 1.00
Quinlan-----	30	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Seepage Slope	1.00 1.00 1.00
Hardeman-----	22	Not limited		Very limited Seepage Slope	1.00 1.00
WQnB: Woodward-----	45	Very limited Depth to bedrock Restricted permeability	1.00 0.46	Very limited Depth to soft bedrock Seepage	1.00 0.53
Quinlan-----	43	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Seepage	1.00 1.00
WQnC: Woodward-----	56	Very limited Depth to bedrock Restricted permeability	1.00 0.46	Very limited Depth to soft bedrock Seepage Slope	1.00 0.53 0.32
Quinlan-----	22	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Seepage Slope	1.00 1.00 0.32
WslA: Westola-----	75	Very limited Flooding	1.00	Very limited Flooding Seepage	1.00 1.00
WstA: Westola-----	88	Somewhat limited Flooding	0.40	Very limited Seepage Flooding	1.00 0.40
YmrA: Yomont-----	100	Somewhat limited Flooding	0.40	Very limited Seepage Flooding	1.00 0.40

Table 12a.--Sanitary Facilities, Part I--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
YmtA: Yomont-----	94	Very limited Flooding	1.00	Very limited Flooding Seepage	1.00 1.00

Table 12b.--Sanitary Facilities, Part II

[The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table]

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AbbA: Abbie-----	100	Not limited		Not limited		Somewhat limited Seepage	0.22
AbbB: Abbie-----	95	Not limited		Not limited		Not limited	
AbbB2: Abbie-----	100	Not limited		Not limited		Somewhat limited Seepage	0.22
AbbC: Abbie-----	95	Not limited		Not limited		Somewhat limited Seepage	0.22
AbbC2: Abbie-----	100	Not limited		Not limited		Somewhat limited Seepage	0.22
AbsB: Abilene-----	85	Very limited Too clayey	1.00	Not limited		Very limited Too clayey	1.00
AclA: Abbie-----	87	Not limited		Not limited		Not limited	
AflB: Abbie-----	100	Not limited		Not limited		Somewhat limited Seepage	0.22
AflC: Abbie-----	100	Not limited		Not limited		Somewhat limited Seepage	0.22
BdaB: Berda-----	84	Not limited		Not limited		Not limited	
BdaC: Berda-----	80	Not limited		Not limited		Not limited	
BdaD: Berda-----	100	Not limited		Not limited		Not limited	
CRVE: Cottonwood-----	37	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Rock outcrop-----	28	Not rated		Not rated		Not rated	
Vinson-----	12	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
DAM: Dam-----	100	Not rated		Not rated		Not rated	

Table 12b.--Sanitary Facilities, Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DevE: Devol-----	100	Very limited Seepage Too Sandy Slope	1.00 1.00 0.16	Very limited Seepage Slope	1.00 0.16	Somewhat limited Seepage Too Sandy Slope	0.52 0.50 0.16
DpwB: Deepwood-----	82	Not limited		Not limited		Not limited	
DpwC: Deepwood-----	79	Not limited		Not limited		Not limited	
DpwD: Deepwood-----	90	Not limited		Not limited		Not limited	
DpwE: Deepwood-----	89	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16
DvlB: Devol-----	83	Very limited Seepage Too Sandy	1.00 1.00	Very limited Seepage	1.00	Somewhat limited Seepage Too Sandy	0.52 0.50
DvlC: Devol-----	93	Very limited Seepage Too Sandy	1.00 1.00	Very limited Seepage	1.00	Somewhat limited Seepage Too Sandy	0.52 0.50
DvlD: Devol-----	90	Very limited Seepage Too Sandy	1.00 1.00	Very limited Seepage	1.00	Somewhat limited Seepage Too Sandy	0.52 0.50
EdlC: Eda-----	86	Very limited Seepage Too Sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too Sandy Seepage	1.00 1.00
EdlE: Eda-----	75	Very limited Seepage Too Sandy Slope	1.00 1.00 0.04	Very limited Seepage Slope	1.00 0.04	Very limited Too Sandy Seepage Slope	1.00 1.00 0.04
FayB: Farry-----	93	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Seepage	1.00
FayC: Farry-----	100	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.51
FoFE: Fortyone-----	70	Very limited Seepage Too Sandy Slope	1.00 1.00 0.04	Very limited Seepage Slope	1.00 0.04	Very limited Too Sandy Seepage Slope Gravel content	1.00 1.00 0.04 0.02

Table 12b.--Sanitary Facilities, Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FoFE: Farry-----	30	Very limited Seepage Too Sandy Slope	1.00 1.00 0.04	Very limited Seepage Slope	1.00 0.04	Very limited Seepage Too Sandy Slope	1.00 0.50 0.04
FrkA: Frankirk-----	77	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
FrkB: Frankirk-----	85	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
FtnB: Fortyone-----	90	Very limited Seepage Too Sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too Sandy Seepage Gravel content	1.00 1.00 0.03
FtnC: Fortyone-----	100	Very limited Seepage Too Sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too Sandy Seepage	1.00 1.00
FtnD: Fortyone-----	90	Very limited Seepage Too Sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too Sandy Seepage	1.00 1.00
GcsA: Gracemore-----	85	Very limited Depth to saturated zone Seepage Flooding	1.00 1.00 0.40	Very limited Depth to saturated zone Seepage Flooding	1.00 1.00 0.40	Very limited Depth to saturated zone Seepage	1.00 1.00
GdfB: Grandfield-----	94	Very limited Seepage	1.00	Not limited		Not limited	
GdfC: Grandfield-----	92	Very limited Seepage	1.00	Not limited		Somewhat limited Seepage	0.52
GDGE: Grandfield-----	48	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.52
Devol-----	32	Very limited Seepage Too Sandy	1.00 1.00	Very limited Seepage	1.00	Somewhat limited Seepage Too Sandy	0.52 0.50
Grandmore-----	20	Not limited		Not limited		Very limited Hard to compact	1.00
GdmB: Grandmore-----	86	Not limited		Not limited		Not limited	

Table 12b.--Sanitary Facilities, Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GfsA: Gracemore-----	100	Very limited Flooding Depth to saturated zone Seepage Too Sandy	1.00 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Depth to saturated zone Too Sandy Seepage	1.00 1.00 1.00
GmrA: Gracemont-----	91	Very limited Depth to saturated zone Seepage Flooding	1.00 1.00 0.40	Very limited Depth to saturated zone Seepage Flooding	1.00 1.00 0.40	Very limited Depth to saturated zone Seepage	1.00 0.22
GmsA: Gracemont-----	100	Very limited Depth to saturated zone Seepage Too clayey Flooding	1.00 1.00 0.50 0.40	Very limited Depth to saturated zone Seepage Flooding	1.00 1.00 0.40	Very limited Depth to saturated zone Too clayey Seepage	1.00 0.50 0.22
GrmA: Gracemore-----	95	Very limited Depth to saturated zone Seepage Flooding	1.00 1.00 0.40	Very limited Depth to saturated zone Seepage Flooding	1.00 1.00 0.40	Very limited Depth to saturated zone Seepage Too clayey	1.00 1.00 0.50
HdGB: Hardeman-----	60	Very limited Seepage Too Sandy	1.00 1.00	Very limited Seepage	1.00	Somewhat limited Seepage Too Sandy	0.52 0.50
Grandmore-----	40	Not limited		Not limited		Not limited	
HdGC: Hardeman-----	70	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.52
Grandmore-----	25	Not limited		Not limited		Very limited Hard to compact	1.00
HdmB: Hardeman-----	85	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.52
HdmC: Hardeman-----	90	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.52
IreA: Irene-----	97	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
IreB: Irene-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50

Table 12b.--Sanitary Facilities, Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
IreC: Irene-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
IreD: Irene-----	100	Not limited		Not limited		Somewhat limited Too clayey	0.50
JssF: Jester-----	100	Very limited Seepage Too Sandy Slope	1.00 1.00 0.04	Very limited Seepage Slope	1.00 0.04	Very limited Too Sandy Seepage Slope	1.00 1.00 0.04
JstC: Jester-----	94	Very limited Seepage Too Sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too Sandy Seepage	1.00 1.00
KidB: Kingsdown-----	100	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.52
KiHE: Kingsdown-----	60	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.52
Hardeman-----	35	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.52
LgtA: Lugert-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	
LiJC: Lincoln-----	51	Very limited Seepage Too Sandy Flooding	1.00 1.00 0.40	Very limited Seepage Flooding	1.00 0.40	Very limited Seepage Too Sandy	1.00 0.50
Jester-----	49	Very limited Seepage Too Sandy Flooding	1.00 1.00 0.40	Very limited Seepage Flooding	1.00 0.40	Very limited Seepage Too Sandy	1.00 0.50
LikB: Likes-----	100	Very limited Too Sandy	1.00	Not limited		Very limited Seepage Too Sandy	1.00 0.50
LisA: Lincoln-----	100	Very limited Flooding Seepage Too Sandy	1.00 1.00 1.00	Very limited Flooding Seepage	1.00 1.00	Very limited Too Sandy Seepage	1.00 1.00



Table 12b.--Sanitary Facilities, Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LncA: Lincoln-----	100	Very limited Seepage Too Sandy Flooding	1.00 1.00 0.40	Very limited Seepage Flooding	1.00 0.40	Very limited Seepage Too Sandy	1.00 0.50
LROE: Laverne-----	70	Somewhat limited Depth to thin cemented pan	0.50	Very limited Depth to cemented pan	1.00	Very limited Depth to cemented pan Carbonate content	1.00 1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
LshA: Lesho-----	83	Very limited Depth to saturated zone Seepage Too Sandy Flooding	1.00 1.00 1.00 0.40	Very limited Depth to saturated zone Seepage Flooding	1.00 1.00 0.40	Very limited Seepage Too Sandy Depth to saturated zone	1.00 0.50 0.09
LsoA: Lincoln-----	83	Very limited Flooding Seepage Too Sandy	1.00 1.00 1.00	Very limited Flooding Seepage	1.00 1.00	Very limited Too Sandy Seepage	1.00 1.00
M-W: Water-----	100	Not rated		Not rated		Not rated	
MLBB: Mobeetie-----	45	Very limited Too Sandy	1.00	Not limited		Somewhat limited Seepage Too Sandy	0.52 0.50
Likes-----	22	Very limited Too Sandy	1.00	Not limited		Very limited Seepage Too Sandy	1.00 0.50
Berda-----	21	Very limited Too Sandy	1.00	Not limited		Somewhat limited Too Sandy	0.50
MLBC: Mobeetie-----	45	Very limited Too Sandy	1.00	Not limited		Somewhat limited Seepage Too Sandy	0.52 0.50
Likes-----	22	Very limited Too Sandy	1.00	Not limited		Very limited Seepage Too Sandy	1.00 0.50
Berda-----	21	Very limited Too Sandy	1.00	Not limited		Somewhat limited Too Sandy	0.50
MLBE: Mobeetie-----	45	Very limited Too Sandy Slope	1.00 0.04	Somewhat limited Slope	0.04	Somewhat limited Seepage Too Sandy Slope	0.52 0.50 0.04

Table 12b.--Sanitary Facilities, Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MLBE: Likes-----	22	Very limited Too Sandy Slope	1.00 0.04	Somewhat limited Slope	0.04	Very limited Seepage Too Sandy Slope	1.00 0.50 0.04
Berda-----	21	Very limited Too Sandy Slope	1.00 0.04	Somewhat limited Slope	0.04	Somewhat limited Too Sandy Slope	0.50 0.04
MnsB: Mansic-----	94	Not limited		Not limited		Not limited	
MnsC: Mansic-----	100	Not limited		Not limited		Not limited	
MsnB: Manson-----	95	Not limited		Not limited		Not limited	
MsnC: Manson-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
MsnC2: Manson-----	95	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
OMBE: Oklark-----	43	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Somewhat limited Seepage Slope	0.52 0.04
Mansic-----	27	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04
Berda-----	23	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04
OMBG: Oklark-----	33	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope Seepage	1.00 0.52
Mansic-----	26	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope Seepage	1.00 0.22
Berda-----	25	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
PdoA: Paloduro-----	100	Not limited		Not limited		Not limited	
PdoB: Paloduro-----	100	Not limited		Not limited		Not limited	
PdoC2: Paloduro-----	90	Not limited		Not limited		Not limited	

Table 12b.--Sanitary Facilities, Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PIT: Pits-----	100	Not rated		Not rated		Not rated	
PlmB: Plemons-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
PlmC: Plemons-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
PlmD: Plemons-----	90	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
QnWC3: Quinlan-----	67	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Seepage	1.00 0.22
Woodward-----	33	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
QnWD: Quinlan-----	48	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Seepage	1.00 0.22
Woodward-----	30	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
QnWE: Quinlan-----	72	Very limited Depth to bedrock Seepage Slope	1.00 1.00 0.04	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Seepage Slope	1.00 0.22 0.04
Woodward-----	24	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Slope	1.00 0.04
QRWG: Quinlan-----	50	Very limited Depth to bedrock Slope Seepage	1.00 1.00 1.00	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to bedrock Slope Seepage	1.00 1.00 0.22
Rock outcrop-----	33	Not rated		Not rated		Not rated	
Woodward-----	17	Very limited Depth to bedrock Slope	1.00 0.84	Very limited Depth to bedrock Slope	1.00 0.84	Very limited Depth to bedrock Slope	1.00 0.84
QRYG: Quinlan-----	41	Very limited Depth to bedrock Slope Seepage	1.00 1.00 1.00	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to bedrock Slope Seepage	1.00 1.00 0.22
Rock outcrop-----	18	Not rated		Not rated		Not rated	

Table 12b.--Sanitary Facilities, Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
QRYG: Yomont-----	17	Very limited Flooding Seepage	1.00 1.00	Very limited Flooding Seepage	1.00 1.00	Somewhat limited Seepage	0.52
QWDE: Quinlan-----	41	Very limited Depth to bedrock Seepage Slope	1.00 1.00 0.04	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Seepage Slope	1.00 0.22 0.04
Woodward-----	38	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Slope	1.00 0.04
Deepwood-----	12	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04
QWRC: Quinlan-----	58	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Seepage	1.00 0.22
Woodward-----	23	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Rock outcrop-----	10	Not rated		Not rated		Not rated	
RoCH: Rock outcrop-----	55	Not rated		Not rated		Not rated	
Cottonwood-----	30	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to bedrock Slope	1.00 1.00
RssA: Rosston-----	100	Very limited Depth to saturated zone Too clayey Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Too clayey Hard to compact Ponding	1.00 1.00 1.00 1.00
SAL: Salt flats-----	100	Not rated		Not rated		Not rated	
SelA: Selman-----	96	Not limited		Not limited		Not limited	
SelB: Selman-----	92	Not limited		Not limited		Not limited	
SelC: Selman-----	87	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
SelC2: Selman-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50

Table 12b.--Sanitary Facilities, Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SelD: Selman-----	94	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
SelD2: Selman-----	81	Not limited		Not limited		Somewhat limited Too clayey	0.50
SprA: Spr-----	87	Somewhat limited Flooding	0.40	Somewhat limited Flooding	0.40	Not limited	
SpsA: Spr-----	100	Somewhat limited Too clayey Flooding	0.50 0.40	Somewhat limited Flooding	0.40	Somewhat limited Too clayey	0.50
StpA: St. Paul-----	92	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
StpB: St. Paul-----	93	Not limited		Not limited		Not limited	
StpC: St. Paul-----	95	Not limited		Not limited		Somewhat limited Too clayey	0.50
StpD: St. Paul-----	96	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
TeWE: Teagard-----	53	Very limited Depth to bedrock Too clayey	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Too clayey Hard to compact	1.00 1.00 1.00
Wellsford-----	33	Very limited Depth to bedrock Too clayey	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Too clayey Hard to compact	1.00 1.00 1.00
TexA: Texroy-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
TexB: Texroy-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
TexC: Texroy-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
TipA: Tipton-----	95	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50

Table 12b.--Sanitary Facilities, Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TipB: Tipton-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
TipC: Tipton-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
TipD: Tipton-----	87	Not limited		Not limited		Not limited	
TRQC: Talpa-----	53	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Quinlan-----	22	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Seepage	1.00 0.22
TvlC: Tivoli-----	85	Very limited Seepage Too Sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too Sandy Seepage	1.00 1.00
TvlE: Tivoli-----	88	Very limited Seepage Too Sandy Slope	1.00 1.00 0.04	Very limited Seepage Slope	1.00 0.04	Very limited Seepage Too Sandy Slope	1.00 0.50 0.04
TvlG: Tivoli-----	97	Very limited Seepage Too Sandy Slope	1.00 1.00 1.00	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Slope Too Sandy	1.00 1.00 0.50
VerB: Vernon-----	75	Very limited Depth to bedrock Too clayey	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Too clayey Hard to compact	1.00 1.00 1.00
VerC: Vernon-----	69	Very limited Depth to bedrock Too clayey	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Too clayey Hard to compact	1.00 1.00 1.00
VerD: Vernon-----	80	Very limited Depth to bedrock Too clayey	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Too clayey Hard to compact	1.00 1.00 1.00

Table 12b.--Sanitary Facilities, Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
VrrB: Vernon-----	86	Very limited Depth to bedrock Too clayey	1.00 0.50	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Hard to compact Too clayey	1.00 1.00 0.50
VrrC: Vernon-----	76	Very limited Depth to bedrock Too clayey	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Too clayey Hard to compact	1.00 1.00 1.00
W: Water-----	100	Not rated		Not rated		Not rated	
WodA: Woods-----	80	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
WodB: Woods-----	86	Somewhat limited Too clayey	0.50	Not limited		Very limited Hard to compact Too clayey	1.00 0.50
WodC: Woods-----	100	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
WQHE: Westola-----	48	Very limited Flooding Seepage	1.00 1.00	Very limited Flooding Seepage	1.00 1.00	Somewhat limited Seepage	0.52
Quinlan-----	30	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Seepage	1.00 0.22
Hardeman-----	22	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.52
WQnB: Woodward-----	45	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Quinlan-----	43	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Seepage	1.00 0.22
WQnC: Woodward-----	56	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Quinlan-----	22	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Seepage	1.00 0.22

Table 12b.--Sanitary Facilities, Part II--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WslA: Westola-----	75	Very limited Flooding Seepage	1.00 1.00	Very limited Flooding Seepage	1.00 1.00	Somewhat limited Seepage	0.52
WstA: Westola-----	88	Very limited Seepage Too clayey Flooding	1.00 0.50 0.40	Very limited Seepage Flooding	1.00 0.40	Somewhat limited Seepage	0.52
YmrA: Yomont-----	100	Very limited Seepage Flooding	1.00 0.40	Very limited Seepage Flooding	1.00 0.40	Somewhat limited Seepage	0.52
YmtA: Yomont-----	94	Very limited Flooding Seepage	1.00 1.00	Very limited Flooding Seepage	1.00 1.00	Somewhat limited Seepage	0.52



## Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Tables 13a and 13b show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the tables are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

*Dwellings* are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

*Small commercial buildings* are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

*Local roads and streets* have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and

grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

*Shallow excavations* are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

*Lawns and landscaping* require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Table 13a.--Building Site Development, Part I

[The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table]

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AbbA: Abbie-----	100	Not limited		Not limited		Not limited	
AbbB: Abbie-----	95	Not limited		Not limited		Not limited	
AbbB2: Abbie-----	100	Not limited		Not limited		Not limited	
AbbC: Abbie-----	95	Not limited		Not limited		Not limited	
AbbC2: Abbie-----	100	Not limited		Not limited		Not limited	
AbsB: Abilene-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
AclA: Abbie-----	87	Not limited		Not limited		Not limited	
AflB: Abbie-----	100	Not limited		Not limited		Not limited	
AflC: Abbie-----	100	Not limited		Not limited		Not limited	
BdaB: Berda-----	84	Not limited		Not limited		Not limited	
BdaC: Berda-----	80	Not limited		Not limited		Not limited	
BdaD: Berda-----	100	Not limited		Not limited		Somewhat limited Slope	0.88
CRVE: Cottonwood-----	37	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
Rock outcrop-----	28	Not rated		Not rated		Not rated	
Vinson-----	12	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to soft bedrock	0.50 0.15	Somewhat limited Shrink-swell	0.50
DAM: Dam-----	100	Not rated		Not rated		Not rated	

Table 13a.--Building Site Development, Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DevE: Devol-----	100	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00
DpwB: Deepwood-----	82	Not limited		Not limited		Not limited	
DpwC: Deepwood-----	79	Not limited		Not limited		Not limited	
DpwD: Deepwood-----	90	Not limited		Not limited		Somewhat limited Slope	0.88
DpwE: Deepwood-----	89	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00
DvlB: Devol-----	83	Not limited		Not limited		Not limited	
DvlC: Devol-----	93	Not limited		Not limited		Not limited	
DvlD: Devol-----	90	Not limited		Not limited		Somewhat limited Slope	0.88
EdlC: Eda-----	86	Not limited		Not limited		Not limited	
EdlE: Eda-----	75	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope	1.00
FayB: Farry-----	93	Not limited		Not limited		Not limited	
FayC: Farry-----	100	Not limited		Not limited		Not limited	
FoFE: Fortyone-----	70	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope	1.00
Farry-----	30	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope	1.00
FrkA: Frankirk-----	77	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
FrkB: Frankirk-----	85	Not limited		Not limited		Not limited	
FtnB: Fortyone-----	90	Not limited		Not limited		Not limited	
FtnC: Fortyone-----	100	Not limited		Not limited		Not limited	

Table 13a.--Building Site Development, Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FtnD: Fortyone-----	90	Not limited		Not limited		Somewhat limited Slope	0.88
GcsA: Gracemore-----	85	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
GdfB: Grandfield-----	94	Not limited		Not limited		Not limited	
GdfC: Grandfield-----	92	Not limited		Not limited		Not limited	
GDGE: Grandfield-----	48	Not limited		Not limited		Somewhat limited Slope	0.50
Devol-----	32	Not limited		Not limited		Very limited Slope	1.00
Grandmore-----	20	Not limited		Somewhat limited Shrink-swell	0.50	Not limited	
GdmB: Grandmore-----	86	Not limited		Not limited		Not limited	
GfsA: Gracemore-----	100	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
GmrA: Gracemont-----	91	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
GmsA: Gracemont-----	100	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
GrmA: Gracemore-----	95	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
HdGB: Hardeman-----	60	Not limited		Not limited		Not limited	
Grandmore-----	40	Not limited		Not limited		Not limited	

Table 13a.--Building Site Development, Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HdGC:							
Hardeman-----	70	Not limited		Not limited		Not limited	
Grandmore-----	25	Not limited		Somewhat limited Shrink-swell	0.50	Not limited	
HdmB:							
Hardeman-----	85	Not limited		Not limited		Not limited	
HdmC:							
Hardeman-----	90	Not limited		Not limited		Not limited	
IreA:							
Irene-----	97	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
IreB:							
Irene-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
IreC:							
Irene-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
IreD:							
Irene-----	100	Somewhat limited Shrink-swell	0.50	Not limited		Somewhat limited Slope Shrink-swell	0.72 0.50
JssF:							
Jester-----	100	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope	1.00
JstC:							
Jester-----	94	Not limited		Not limited		Not limited	
KidB:							
Kingsdown-----	100	Not limited		Not limited		Not limited	
KiHE:							
Kingsdown-----	60	Not limited		Not limited		Somewhat limited Slope	0.50
Hardeman-----	35	Not limited		Not limited		Very limited Slope	1.00
LgtA:							
Lugert-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
LiJC:							
Lincoln-----	51	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Jester-----	49	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
LikB:							
Likes-----	100	Not limited		Not limited		Not limited	

Table 13a.--Building Site Development, Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LisA: Lincoln-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
LncA: Lincoln-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
LROE: Laverne-----	70	Somewhat limited Depth to thin cemented pan	1.00	Very limited Depth to thin cemented pan	1.00	Very limited Depth to thin cemented pan Slope	1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
LshA: Lesho-----	83	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 0.95	Very limited Flooding Shrink-swell	1.00 0.50
LsoA: Lincoln-----	83	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
M-W: Water-----	100	Not rated		Not rated		Not rated	
MLBB: Mobeetie-----	45	Not limited		Not limited		Not limited	
Likes-----	22	Not limited		Not limited		Not limited	
Berda-----	21	Not limited		Not limited		Not limited	
MLBC: Mobeetie-----	45	Not limited		Not limited		Not limited	
Likes-----	22	Not limited		Not limited		Not limited	
Berda-----	21	Not limited		Not limited		Not limited	
MLBE: Mobeetie-----	45	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope	1.00
Likes-----	22	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope	1.00
Berda-----	21	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope	1.00
MnsB: Mansic-----	94	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
MnsC: Mansic-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50

Table 13a.--Building Site Development, Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MsnB: Manson-----	95	Not limited		Not limited		Not limited	
MsnC: Manson-----	100	Not limited		Not limited		Not limited	
MsnC2: Manson-----	95	Not limited		Not limited		Not limited	
OMBE: Okark-----	43	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope	1.00
Mansic-----	27	Somewhat limited Shrink-swell Slope	0.50 0.04	Somewhat limited Slope	0.04	Very limited Slope Shrink-swell	1.00 0.50
Berda-----	23	Somewhat limited Shrink-swell Slope	0.50 0.04	Somewhat limited Shrink-swell Slope	0.50 0.04	Very limited Slope Shrink-swell	1.00 0.50
OMBG: Okark-----	33	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Mansic-----	26	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Berda-----	25	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
PdoA: Paloduro-----	100	Not limited		Not limited		Not limited	
PdoB: Paloduro-----	100	Not limited		Not limited		Not limited	
PdoC2: Paloduro-----	90	Not limited		Not limited		Not limited	
PIT: Pits-----	100	Not rated		Not rated		Not rated	
PlmB: Plemons-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
PlmC: Plemons-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
PlmD: Plemons-----	90	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Slope Shrink-swell	0.88 0.50
QnWC3: Quinlan-----	67	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock	1.00



Table 13a.--Building Site Development, Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
QnWC3: Woodward-----	33	Not limited		Somewhat limited Depth to soft bedrock	0.46	Not limited	
QnWD: Quinlan-----	48	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock Slope	1.00 0.88
Woodward-----	30	Not limited		Somewhat limited Depth to soft bedrock	0.84	Somewhat limited Slope	0.88
QnWE: Quinlan-----	72	Somewhat limited Depth to soft bedrock Slope	1.00 0.04	Very limited Depth to soft bedrock Slope	1.00 0.04	Very limited Depth to soft bedrock Slope	1.00 1.00
Woodward-----	24	Somewhat limited Slope	0.04	Somewhat limited Depth to soft bedrock Slope	0.97 0.04	Very limited Slope	1.00
QRWG: Quinlan-----	50	Very limited Depth to soft bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
Rock outcrop-----	33	Not rated		Not rated		Not rated	
Woodward-----	17	Somewhat limited Slope	0.84	Somewhat limited Depth to soft bedrock Slope	0.97 0.84	Very limited Slope	1.00
QRYG: Quinlan-----	41	Very limited Depth to soft bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
Rock outcrop-----	18	Not rated		Not rated		Not rated	
Yomont-----	17	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
QWDE: Quinlan-----	41	Somewhat limited Depth to soft bedrock Slope	1.00 0.04	Very limited Depth to soft bedrock Slope	1.00 0.04	Very limited Depth to soft bedrock Slope	1.00 1.00

Table 13a.--Building Site Development, Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
QWDE: Woodward-----	38	Somewhat limited Slope	0.04	Somewhat limited Depth to soft bedrock Slope	0.84 0.04	Very limited Slope	1.00
Deepwood-----	12	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope	1.00
QWRC: Quinlan-----	58	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock	1.00
Woodward-----	23	Not limited		Somewhat limited Depth to soft bedrock	0.01	Not limited	
Rock outcrop-----	10	Not rated		Not rated		Not rated	
RoCH: Rock outcrop-----	55	Not rated		Not rated		Not rated	
Cottonwood-----	30	Very limited Depth to soft bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
RssA: Rosston-----	100	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00
SAL: Salt flats-----	100	Not rated		Not rated		Not rated	
SelA: Selman-----	96	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
SelB: Selman-----	92	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
SelC: Selman-----	87	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
SelC2: Selman-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
SelD: Selman-----	94	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Slope Shrink-swell	0.88 0.50

Table 13a.--Building Site Development, Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SelD2: Selman-----	81	Somewhat limited Shrink-swell	0.50	Not limited		Somewhat limited Slope Shrink-swell	0.88 0.50
SprA: Spur-----	87	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50
SpsA: Spur-----	100	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50
StpA: St. Paul-----	92	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
StpB: St. Paul-----	93	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
StpC: St. Paul-----	95	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
StpD: St. Paul-----	96	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Slope Shrink-swell	0.50 0.50
TeWE: Teagard-----	53	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to soft bedrock	1.00 0.46	Very limited Shrink-swell Slope	1.00 0.12
Wellsford-----	33	Very limited Depth to soft bedrock Shrink-swell	1.00 1.00	Very limited Shrink-swell Depth to soft bedrock	1.00 1.00	Very limited Depth to soft bedrock Shrink-swell Slope	1.00 1.00 1.00
TexA: Texroy-----	100	Not limited		Not limited		Not limited	
TexB: Texroy-----	100	Not limited		Not limited		Not limited	
TexC: Texroy-----	100	Not limited		Not limited		Not limited	
TipA: Tipton-----	95	Not limited		Not limited		Not limited	
TipB: Tipton-----	100	Not limited		Not limited		Not limited	

Table 13a.--Building Site Development, Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TipC: Tipton-----	100	Not limited		Not limited		Not limited	
TipD: Tipton-----	87	Not limited		Not limited		Somewhat limited Slope	0.50
TRQC: Talpa-----	53	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Quinlan-----	22	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock	1.00
TvlC: Tivoli-----	85	Not limited		Not limited		Not limited	
TvlE: Tivoli-----	88	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope	1.00
TvlG: Tivoli-----	97	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
VerB: Vernon-----	75	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to soft bedrock	1.00 0.15	Very limited Shrink-swell	1.00
VerC: Vernon-----	69	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to soft bedrock	1.00 0.10	Very limited Shrink-swell	1.00
VerD: Vernon-----	80	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to soft bedrock	1.00 0.79	Very limited Shrink-swell Slope	1.00 0.88
VrrB: Vernon-----	86	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to soft bedrock	1.00 0.01	Very limited Shrink-swell	1.00
VrrC: Vernon-----	76	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to soft bedrock	1.00 0.03	Very limited Shrink-swell	1.00

Table 13a.--Building Site Development, Part I--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
W: Water-----	100	Not rated		Not rated		Not rated	
WodA: Woods-----	80	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
WodB: Woods-----	86	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
WodC: Woods-----	100	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
WQHE: Westola-----	48	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Quinlan-----	30	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock Slope	1.00 0.88
Hardeman-----	22	Not limited		Not limited		Somewhat limited Slope	0.88
WQnB: Woodward-----	45	Not limited		Somewhat limited Depth to soft bedrock	0.84	Not limited	
Quinlan-----	43	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock	1.00
WQnC: Woodward-----	56	Not limited		Somewhat limited Depth to soft bedrock	0.46	Not limited	
Quinlan-----	22	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock	1.00
WslA: Westola-----	75	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
WstA: Westola-----	88	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
YmrA: Yomont-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
YmtA: Yomont-----	94	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00

Table 13b.--Building Site Development, Part II

[The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table]

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AbbA: Abbie-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
AbbB: Abbie-----	95	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
AbbB2: Abbie-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
AbbC: Abbie-----	95	Very limited Low strength	1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
AbbC2: Abbie-----	100	Very limited Low strength	1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
AbsB: Abilene-----	85	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave Too clayey	0.10 0.01	Not limited	
AclA: Abbie-----	87	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
AflB: Abbie-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
AflC: Abbie-----	100	Very limited Low strength	1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
BdaB: Berda-----	84	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
BdaC: Berda-----	80	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
BdaD: Berda-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
CRVE: Cottonwood-----	37	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Cutbanks cave	1.00 0.10	Very limited Depth to bedrock Droughty	1.00 1.00

Table 13b.--Building Site Development, Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CRVE: Rock outcrop-----	28	Not rated		Not rated		Not rated	
Vinson-----	12	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Depth to dense layer Depth to soft bedrock Cutbanks cave	0.50 0.15 0.10	Somewhat limited Depth to bedrock	0.16
DAM: Dam-----	100	Not rated		Not rated		Not rated	
DevE: Devol-----	100	Somewhat limited Slope	0.16	Very limited Cutbanks cave Slope	1.00 0.16	Somewhat limited Slope	0.16
DpwB: Deepwood-----	82	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
DpwC: Deepwood-----	79	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
DpwD: Deepwood-----	90	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
DpwE: Deepwood-----	89	Somewhat limited Slope	0.16	Somewhat limited Slope Cutbanks cave	0.16 0.10	Somewhat limited Slope	0.16
DvlB: Devol-----	83	Not limited		Very limited Cutbanks cave	1.00	Not limited	
DvlC: Devol-----	93	Not limited		Very limited Cutbanks cave	1.00	Not limited	
DvlD: Devol-----	90	Not limited		Very limited Cutbanks cave	1.00	Not limited	
EdlC: Eda-----	86	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.57
EdlE: Eda-----	75	Somewhat limited Slope	0.04	Very limited Cutbanks cave Slope	1.00 0.04	Somewhat limited Droughty Slope	0.52 0.04
FayB: Farry-----	93	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	

Table 13b.--Building Site Development, Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FayC: Farry-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
FoFE: Fortyone-----	70	Somewhat limited Slope	0.04	Very limited Cutbanks cave Slope	1.00 0.04	Somewhat limited Slope Droughty	0.04 0.01
Farry-----	30	Somewhat limited Slope	0.04	Very limited Cutbanks cave Slope	1.00 0.04	Somewhat limited Slope	0.04
FrkA: Frankirk-----	77	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
FrkB: Frankirk-----	85	Somewhat limited Low strength	0.78	Somewhat limited Cutbanks cave	0.10	Not limited	
FtnB: Fortyone-----	90	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.06
FtnC: Fortyone-----	100	Not limited		Very limited Cutbanks cave	1.00	Not limited	
FtnD: Fortyone-----	90	Not limited		Very limited Cutbanks cave	1.00	Not limited	
GcsA: Gracemore-----	85	Very limited Low strength Depth to saturated zone Flooding	1.00 0.90 0.40	Very limited Depth to saturated zone Cutbanks cave	1.00 1.00 1.00	Somewhat limited Depth to saturated zone	0.90
GdfB: Grandfield-----	94	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
GdfC: Grandfield-----	92	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
GDGE: Grandfield-----	48	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
Devol-----	32	Not limited		Very limited Cutbanks cave	1.00	Not limited	
Grandmore-----	20	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	



Table 13b.--Building Site Development, Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GdmB: Grandmore-----	86	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
GfsA: Gracemore-----	100	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Flooding	1.00 1.00 0.60	Very limited Salinity Depth to saturated zone Flooding Droughty	1.00 1.00 0.60 0.48
GmrA: Gracemont-----	91	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Cutbanks cave	1.00 0.10	Very limited Depth to saturated zone	1.00
GmsA: Gracemont-----	100	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Cutbanks cave	1.00 1.00	Very limited Salinity Depth to saturated zone	1.00 1.00
GrmA: Gracemore-----	95	Somewhat limited Depth to saturated zone Flooding	0.90 0.40	Very limited Depth to saturated zone Cutbanks cave	1.00 1.00	Very limited Salinity Depth to saturated zone	1.00 0.90
HdGB: Hardeman-----	60	Not limited		Very limited Cutbanks cave	1.00	Not limited	
Grandmore-----	40	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
HdGC: Hardeman-----	70	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
Grandmore-----	25	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
HdmB: Hardeman-----	85	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
HdmC: Hardeman-----	90	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
IreA: Irene-----	97	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	

Table 13b.--Building Site Development, Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
IreB: Irene-----	100	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
IreC: Irene-----	100	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
IreD: Irene-----	100	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
JssF: Jester-----	100	Somewhat limited Slope	0.04	Very limited Cutbanks cave Slope	1.00 0.04	Very limited Droughty Too sandy Slope	0.99 0.50 0.04
JstC: Jester-----	94	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.96
KidB: Kingsdown-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
KiHE: Kingsdown-----	60	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
Hardeman-----	35	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
LgtA: Lugert-----	100	Very limited Flooding	1.00	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60
LiJC: Lincoln-----	51	Somewhat limited Flooding	0.40	Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.61
Jester-----	49	Somewhat limited Flooding	0.40	Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.97
LikB: Likes-----	100	Not limited		Very limited Cutbanks cave	1.00	Very limited Droughty	1.00
LisA: Lincoln-----	100	Very limited Flooding	1.00	Very limited Cutbanks cave Flooding	1.00 0.80	Very limited Flooding Droughty Too sandy	1.00 0.95 0.50

Table 13b.--Building Site Development, Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LncA: Lincoln-----	100	Somewhat limited Flooding	0.40	Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.48
LROE: Laverne-----	70	Somewhat limited Depth to thin cemented pan	1.00	Very limited Depth to thin cemented pan Cutbanks cave	1.00 0.10	Very limited Depth to cemented pan Droughty Carbonate content	1.00 1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
LshA: Lesho-----	83	Very limited Low strength Shrink-swell Flooding	1.00 0.50 0.40	Very limited Cutbanks cave Depth to saturated zone	1.00 0.95	Not limited	
LsoA: Lincoln-----	83	Very limited Flooding	1.00	Very limited Cutbanks cave Flooding	1.00 0.60	Somewhat limited Droughty Flooding Too sandy	0.84 0.60 0.50
M-W: Water-----	100	Not rated		Not rated		Not rated	
MLBB: Mobeetie-----	45	Not limited		Very limited Cutbanks cave	1.00	Not limited	
Likes-----	22	Not limited		Very limited Cutbanks cave	1.00	Very limited Droughty	1.00
Berda-----	21	Not limited		Very limited Cutbanks cave	1.00	Not limited	
MLBC: Mobeetie-----	45	Not limited		Very limited Cutbanks cave	1.00	Not limited	
Likes-----	22	Not limited		Very limited Cutbanks cave	1.00	Very limited Droughty	1.00
Berda-----	21	Not limited		Very limited Cutbanks cave	1.00	Not limited	
MLBE: Mobeetie-----	45	Somewhat limited Slope	0.04	Very limited Cutbanks cave Slope	1.00 0.04	Somewhat limited Slope	0.04
Likes-----	22	Somewhat limited Slope	0.04	Very limited Cutbanks cave Slope	1.00 0.04	Very limited Droughty Slope	1.00 0.04
Berda-----	21	Somewhat limited Slope	0.04	Very limited Cutbanks cave Slope	1.00 0.04	Somewhat limited Slope	0.04

Table 13b.--Building Site Development, Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MnsB: Mansic-----	94	Somewhat limited Low strength Shrink-swell	0.78 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
MnsC: Mansic-----	100	Somewhat limited Low strength Shrink-swell	0.78 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
MsnB: Manson-----	95	Very limited Low strength	1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
MsnC: Manson-----	100	Very limited Low strength	1.00	Very limited Cutbanks cave	1.00	Not limited	
MsnC2: Manson-----	95	Very limited Low strength	1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
OMBE: Okark-----	43	Somewhat limited Slope	0.04	Somewhat limited Cutbanks cave Slope	0.10 0.04	Somewhat limited Slope	0.04
Mansic-----	27	Very limited Low strength Shrink-swell Slope	1.00 0.50 0.04	Somewhat limited Cutbanks cave Slope	0.10 0.04	Somewhat limited Slope	0.04
Berda-----	23	Very limited Low strength Shrink-swell Slope	1.00 0.50 0.04	Somewhat limited Cutbanks cave Slope	0.10 0.04	Somewhat limited Slope	0.04
OMBG: Okark-----	33	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
Mansic-----	26	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
Berda-----	25	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
PdoA: Paloduro-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
PdoB: Paloduro-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	

Table 13b.--Building Site Development, Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PdoC2: Paloduro-----	90	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
PIT: Pits-----	100	Not rated		Not rated		Not rated	
PlmB: Plemons-----	100	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
PlmC: Plemons-----	100	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
PlmD: Plemons-----	90	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
QnWC3: Quinlan-----	67	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Depth to dense layer Cutbanks cave	1.00 0.50 0.10	Very limited Depth to bedrock Droughty	1.00 1.00
Woodward-----	33	Not limited		Somewhat limited Depth to dense layer Depth to soft bedrock Cutbanks cave	0.50 0.46 0.10	Somewhat limited Depth to bedrock	0.46
QnWD: Quinlan-----	48	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Depth to dense layer Cutbanks cave	1.00 0.50 0.10	Very limited Depth to bedrock Droughty	1.00 0.84
Woodward-----	30	Not limited		Somewhat limited Depth to soft bedrock Depth to dense layer Cutbanks cave	0.84 0.50 0.10	Somewhat limited Depth to bedrock	0.84
QnWE: Quinlan-----	72	Somewhat limited Depth to soft bedrock Slope	1.00 0.04	Very limited Depth to soft bedrock Depth to dense layer Cutbanks cave Slope	1.00 0.50 0.10 0.04	Very limited Depth to bedrock Droughty Slope	1.00 0.46 0.04

Table 13b.--Building Site Development, Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
QnWE: Woodward-----	24	Somewhat limited Slope	0.04	Somewhat limited Depth to soft bedrock Depth to dense layer Cutbanks cave Slope	0.97 0.50 0.10 0.04	Somewhat limited Depth to bedrock Slope	0.97 0.04
QRWG: Quinlan-----	50	Very limited Depth to soft bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Depth to dense layer Cutbanks cave	1.00 1.00 0.50 0.10	Very limited Depth to bedrock Slope Droughty	1.00 1.00 0.93
Rock outcrop-----	33	Not rated		Not rated		Not rated	
Woodward-----	17	Somewhat limited Slope	0.84	Somewhat limited Depth to soft bedrock Slope Depth to dense layer Cutbanks cave	0.97 0.84 0.50 0.10	Somewhat limited Depth to bedrock Slope	0.97 0.84
QRYG: Quinlan-----	41	Very limited Depth to soft bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Depth to dense layer Cutbanks cave	1.00 1.00 0.50 0.10	Very limited Depth to bedrock Slope Droughty	1.00 1.00 0.85
Rock outcrop-----	18	Not rated		Not rated		Not rated	
Yomont-----	17	Very limited Flooding	1.00	Somewhat limited Flooding Cutbanks cave	0.80 0.10	Very limited Flooding	1.00
QWDE: Quinlan-----	41	Somewhat limited Depth to soft bedrock Slope	1.00 0.04	Very limited Depth to soft bedrock Depth to dense layer Cutbanks cave Slope	1.00 0.50 0.10 0.04	Very limited Depth to bedrock Droughty Slope	1.00 0.84 0.04
Woodward-----	38	Somewhat limited Slope	0.04	Somewhat limited Depth to soft bedrock Depth to dense layer Cutbanks cave Slope	0.84 0.50 0.10 0.04	Somewhat limited Depth to bedrock Slope	0.84 0.04

Table 13b.--Building Site Development, Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
QWDE: Deepwood-----	12	Somewhat limited Slope	0.04	Somewhat limited Cutbanks cave Slope	0.10 0.04	Somewhat limited Slope	0.04
QWRC: Quinlan-----	58	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Depth to dense layer Cutbanks cave	1.00 0.50 0.10	Very limited Depth to bedrock Droughty	1.00 0.96
Woodward-----	23	Not limited		Somewhat limited Depth to dense layer Cutbanks cave Depth to soft bedrock	0.50 0.10 0.01	Somewhat limited Depth to bedrock	0.01
Rock outcrop-----	10	Not rated		Not rated		Not rated	
RoCH: Rock outcrop-----	55	Not rated		Not rated		Not rated	
Cottonwood-----	30	Very limited Depth to soft bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Cutbanks cave	1.00 1.00 0.10	Very limited Depth to bedrock Droughty Slope	1.00 1.00 1.00
RssA: Rosston-----	100	Very limited Shrink-swell Depth to saturated zone Low strength Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Ponding Too clayey	1.00 1.00 1.00 0.88	Very limited Too clayey Depth to saturated zone Ponding	1.00 1.00 1.00
SAL: Salt flats-----	100	Not rated		Not rated		Not rated	
SelA: Selman-----	96	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
SelB: Selman-----	92	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
SelC: Selman-----	87	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	

Table 13b.--Building Site Development, Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SelC2: Selman-----	100	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
SelD: Selman-----	94	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
SelD2: Selman-----	81	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
SprA: Spur-----	87	Very limited Low strength Shrink-swell Flooding	1.00 0.50 0.40	Somewhat limited Cutbanks cave	0.10	Not limited	
SpsA: Spur-----	100	Very limited Low strength Shrink-swell Flooding	1.00 0.50 0.40	Somewhat limited Cutbanks cave	0.10	Somewhat limited Salinity	0.50
StpA: St. Paul-----	92	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
StpB: St. Paul-----	93	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
StpC: St. Paul-----	95	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
StpD: St. Paul-----	96	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
TeWE: Teagard-----	53	Very limited Low strength Shrink-swell	1.00 1.00	Very limited Cutbanks cave Depth to dense layer Depth to soft bedrock Too clayey	1.00 0.50 0.46 0.28	Somewhat limited Depth to bedrock	0.46



Table 13b.--Building Site Development, Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TeWE: Wellsford-----	33	Very limited Depth to soft bedrock Low strength Shrink-swell	1.00 1.00 1.00	Very limited Depth to soft bedrock Depth to dense layer Cutbanks cave	1.00 0.50 0.10	Very limited Depth to bedrock Droughty	1.00 1.00
TexA: Texroy-----	100	Very limited Low strength	1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
TexB: Texroy-----	100	Very limited Low strength	1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
TexC: Texroy-----	100	Very limited Low strength	1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
TipA: Tipton-----	95	Very limited Low strength	1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
TipB: Tipton-----	100	Very limited Low strength	1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
TipC: Tipton-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
TipD: Tipton-----	87	Very limited Low strength	1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
TRQC: Talpa-----	53	Very limited Depth to hard bedrock Low strength	1.00 1.00	Very limited Depth to hard bedrock Cutbanks cave	1.00 0.10	Very limited Depth to bedrock Droughty	1.00 1.00
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Quinlan-----	22	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Depth to dense layer Cutbanks cave	1.00 0.50 0.10	Very limited Depth to bedrock Droughty	1.00 0.85
Tv1C: Tivoli-----	85	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.96
Tv1E: Tivoli-----	88	Somewhat limited Slope	0.04	Very limited Cutbanks cave Slope	1.00 0.04	Somewhat limited Droughty Slope	0.86 0.04

Table 13b.--Building Site Development, Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Tv1G: Tivoli-----	97	Very limited Slope	1.00	Very limited Cutbanks cave Slope	1.00 1.00	Very limited Slope Droughty	1.00 0.95
VerB: Vernon-----	75	Very limited Low strength Shrink-swell	1.00 1.00	Somewhat limited Too clayey Depth to dense layer Depth to soft bedrock Cutbanks cave	0.50 0.50 0.15 0.10	Somewhat limited Depth to bedrock	0.16
VerC: Vernon-----	69	Very limited Low strength Shrink-swell	1.00 1.00	Very limited Cutbanks cave Too clayey Depth to dense layer Depth to soft bedrock	1.00 0.50 0.50 0.10	Somewhat limited Depth to bedrock	0.10
VerD: Vernon-----	80	Very limited Low strength Shrink-swell	1.00 1.00	Very limited Cutbanks cave Depth to soft bedrock Too clayey Depth to dense layer	1.00 0.79 0.50 0.50	Somewhat limited Depth to bedrock Droughty	0.80 0.12
VrrB: Vernon-----	86	Very limited Low strength Shrink-swell	1.00 1.00	Somewhat limited Depth to dense layer Cutbanks cave Depth to soft bedrock	0.50 0.10 0.01	Somewhat limited Depth to bedrock	0.01
VrrC: Vernon-----	76	Very limited Low strength Shrink-swell	1.00 1.00	Very limited Cutbanks cave Too clayey Depth to dense layer Depth to soft bedrock	1.00 0.50 0.50 0.03	Somewhat limited Depth to bedrock	0.03
W: Water-----	100	Not rated		Not rated		Not rated	
WodA: Woods-----	80	Very limited Low strength Shrink-swell	1.00 1.00	Very limited Cutbanks cave Too clayey	1.00 0.28	Not limited	

Table 13b.--Building Site Development, Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WodB: Woods-----	86	Very limited Low strength Shrink-swell	1.00 1.00	Very limited Cutbanks cave Too clayey	1.00 0.28	Not limited	
WodC: Woods-----	100	Very limited Low strength Shrink-swell	1.00 1.00	Very limited Cutbanks cave Too clayey	1.00 0.28	Not limited	
WQHE: Westola-----	48	Very limited Flooding	1.00	Very limited Cutbanks cave Flooding	1.00 0.60	Somewhat limited Flooding	0.60
Quinlan-----	30	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Depth to dense layer Cutbanks cave	1.00 0.50 0.10	Very limited Depth to bedrock Droughty	1.00 0.78
Hardeman-----	22	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
WQnB: Woodward-----	45	Not limited		Somewhat limited Depth to soft bedrock Depth to dense layer Cutbanks cave	0.84 0.50 0.10	Somewhat limited Depth to bedrock	0.84
Quinlan-----	43	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Depth to dense layer Cutbanks cave	1.00 0.50 0.10	Very limited Depth to bedrock Droughty	1.00 0.46
WQnC: Woodward-----	56	Not limited		Somewhat limited Depth to dense layer Depth to soft bedrock Cutbanks cave	0.50 0.46 0.10	Somewhat limited Depth to bedrock	0.46
Quinlan-----	22	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Depth to dense layer Cutbanks cave	1.00 0.50 0.10	Very limited Depth to bedrock Droughty	1.00 0.93
WslA: Westola-----	75	Very limited Flooding	1.00	Very limited Cutbanks cave Flooding	1.00 0.60	Somewhat limited Flooding	0.60

Table 13b.--Building Site Development, Part II--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WstA: Westola-----	88	Somewhat limited Flooding	0.40	Somewhat limited Cutbanks cave	0.10	Not limited	
YmrA: Yomont-----	100	Somewhat limited Flooding	0.40	Somewhat limited Cutbanks cave	0.10	Not limited	
YmtA: Yomont-----	94	Very limited Flooding	1.00	Very limited Cutbanks cave Flooding	1.00 0.60	Somewhat limited Flooding	0.60

## Construction Materials

Tables 14a and 14b give information about the soils as potential sources of gravel, sand, topsoil, reclamation material, and roadfill. Normal compaction, minor processing, and other standard construction practices are assumed.

*Sand and gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 14a, only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

The soils are rated *good, fair, or poor* as potential sources of sand and gravel. A rating of *good or fair* means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

The soils are rated *good, fair, or poor* as potential sources of topsoil, reclamation material, and roadfill. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of topsoil, reclamation material, or roadfill. The lower the number, the greater the limitation.

*Topsoil* is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

*Reclamation material* is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

*Roadfill* is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill

for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Table 14a.--Construction Materials, Part I

[The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table]

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
AbbA: Abbie-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
AbbB: Abbie-----	95	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
AbbB2: Abbie-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
AbbC: Abbie-----	95	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
AbbC2: Abbie-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.04
AbsB: Abilene-----	85	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
AclA: Abbie-----	87	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
AflB: Abbie-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
AflC: Abbie-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.04
BdaB: Berda-----	84	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00

Table 14a.--Construction Materials, Part I--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
BdaC: Berda-----	80	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
BdaD: Berda-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
CRVE: Cottonwood-----	37	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Rock outcrop-----	28	Not rated		Not rated	
Vinson-----	12	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
DAM: Dam-----	100	Not rated		Not rated	
DevE: Devol-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Bottom layer Thickest layer	 0.05 0.06
DpwB: Deepwood-----	82	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
DpwC: Deepwood-----	79	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
DpwD: Deepwood-----	90	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
DpwE: Deepwood-----	89	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
DvlB: Devol-----	83	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.05
DvlC: Devol-----	93	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.05



Table 14a.--Construction Materials, Part I--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Dv1D: Devol-----	90	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.05
Ed1C: Eda-----	86	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.02
		Thickest layer	0.00	Bottom layer	0.26
Ed1E: Eda-----	75	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.08
		Thickest layer	0.00	Bottom layer	0.69
FayB: Farry-----	93	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.02
FayC: Farry-----	100	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.03
FoFE: Fortyone-----	70	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.11
		Thickest layer	0.00	Thickest layer	0.11
Farry-----	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.17
		Thickest layer	0.00	Thickest layer	0.17
FrkA: Frankirk-----	77	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FrkB: Frankirk-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FtnB: Fortyone-----	90	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.05
		Thickest layer	0.00	Bottom layer	0.34
FtnC: Fortyone-----	100	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.42
FtnD: Fortyone-----	90	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.17

Table 14a.--Construction Materials, Part I--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
GcsA: Gracemore-----	85	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
GdfB: Grandfield-----	94	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.04
GdfC: Grandfield-----	92	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.04
GDGE: Grandfield-----	48	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Devol-----	32	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.06
Grandmore-----	20	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
GdmB: Grandmore-----	86	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
GfsA: Gracemore-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Bottom layer Thickest layer	 0.13 0.13
GmrA: Gracemont-----	91	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
GmsA: Gracemont-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.12
GrmA: Gracemore-----	95	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
HdGB: Hardeman-----	60	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.03 0.12
Grandmore-----	40	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00

Table 14a.--Construction Materials, Part I--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
HdGC: Hardeman-----	70	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Grandmore-----	25	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
HdmB: Hardeman-----	85	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
HdmC: Hardeman-----	90	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
IreA: Irene-----	97	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
IreB: Irene-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
IreC: Irene-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
IreD: Irene-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
JssF: Jester-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Bottom layer Thickest layer	 0.00 0.36
JstC: Jester-----	94	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.07 0.12
KidB: Kingsdown-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
KiHE: Kingsdown-----	60	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.06

Table 14a.--Construction Materials, Part I--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
KiHE: Hardeman-----	35	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
LgtA: Lugert-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
LiJC: Lincoln-----	51	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.21
Jester-----	49	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Bottom layer Thickest layer	 0.07 0.07
LikB: Likes-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Bottom layer Thickest layer	 0.06 0.06
LisA: Lincoln-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.06 0.30
LncA: Lincoln-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.06 0.21
LrOE: Laverne-----	70	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Rock outcrop-----	20	Not rated		Not rated	
LshA: Lesho-----	83	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.10
LsoA: Lincoln-----	83	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Bottom layer Thickest layer	 0.00 0.11
M-W: Water-----	100	Not rated		Not rated	
MLBB: Mobeetie-----	45	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.26

Table 14a.--Construction Materials, Part I--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
MLBB:					
Likes-----	22	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.21
Berda-----	21	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.02
MLBC:					
Mobeetie-----	45	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.26
Likes-----	22	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.21
		Thickest layer	0.00	Thickest layer	0.21
Berda-----	21	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.06
MLBE:					
Mobeetie-----	45	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.26
Likes-----	22	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.06
		Thickest layer	0.00	Bottom layer	0.21
Berda-----	21	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.20
MnsB:					
Mansic-----	94	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MnsC:					
Mansic-----	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MsnB:					
Manson-----	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MsnC:					
Manson-----	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MsnC2:					
Manson-----	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 14a.--Construction Materials, Part I--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
OMBE:					
Oklark-----	43	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.04
Mansic-----	27	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Berda-----	23	Poor		Poor	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.00
OMBG:					
Oklark-----	33	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.03
Mansic-----	26	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.02
Berda-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PdoA:					
Paloduro-----	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PdoB:					
Paloduro-----	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PdoC2:					
Paloduro-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PIT:					
Pits-----	100	Not rated		Not rated	
PlmB:					
Plemons-----	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PlmC:					
Plemons-----	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PlmD:					
Plemons-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 14a.--Construction Materials, Part I--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
QnWC3: Quinlan-----	67	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Woodward-----	33	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
QnWD: Quinlan-----	48	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Woodward-----	30	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
QnWE: Quinlan-----	72	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Woodward-----	24	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
QRWG: Quinlan-----	50	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Rock outcrop-----	33	Not rated		Not rated	
Woodward-----	17	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
QRYG: Quinlan-----	41	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Rock outcrop-----	18	Not rated		Not rated	
Yomont-----	17	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
QWDE: Quinlan-----	41	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Woodward-----	38	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Deepwood-----	12	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00

Table 14a.--Construction Materials, Part I--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
QWRC:					
Quinlan-----	58	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Woodward-----	23	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rock outcrop-----	10	Not rated		Not rated	
RoCH:					
Rock outcrop-----	55	Not rated		Not rated	
Cottonwood-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RssA:					
Rosston-----	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SAL:					
Salt flats-----	100	Not rated		Not rated	
SelA:					
Selman-----	96	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SelB:					
Selman-----	92	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SelC:					
Selman-----	87	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SelC2:					
Selman-----	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SelD:					
Selman-----	94	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SelD2:					
Selman-----	81	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SprA:					
Spur-----	87	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00



Table 14a.--Construction Materials, Part I--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
SpsA: Spur-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
StpA: St. Paul-----	92	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
StpB: St. Paul-----	93	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
StpC: St. Paul-----	95	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
StpD: St. Paul-----	96	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
TeWE: Teagard-----	53	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Wellsford-----	33	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
TexA: Texroy-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
TexB: Texroy-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
TexC: Texroy-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
TipA: Tipton-----	95	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
TipB: Tipton-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00

Table 14a.--Construction Materials, Part I--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
TipC: Tipton-----	100	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
TipD: Tipton-----	87	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
TRQC: Talpa-----	53	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Rock outcrop-----	25	Not rated		Not rated	
Quinlan-----	22	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Tv1C: Tivoli-----	85	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.25 0.31
Tv1E: Tivoli-----	88	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Bottom layer Thickest layer	 0.08 0.25
Tv1G: Tivoli-----	97	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Bottom layer Thickest layer	 0.03 0.03
VerB: Vernon-----	75	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
VerC: Vernon-----	69	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
VerD: Vernon-----	80	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
VrrB: Vernon-----	86	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
VrrC: Vernon-----	76	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Bottom layer Thickest layer	 0.00 0.04

Table 14a.--Construction Materials, Part I--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
W: Water-----	100	Not rated		Not rated	
WodA: Woods-----	80	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
WodB: Woods-----	86	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
WodC: Woods-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
WQHE: Westola-----	48	Poor Bottom layer Thickest layer	0.00 0.00	Poor Thickest layer Bottom layer	0.00 0.00
Quinlan-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Hardeman-----	22	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
WQnB: Woodward-----	45	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Quinlan-----	43	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
WQnC: Woodward-----	56	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Quinlan-----	22	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
WslA: Westola-----	75	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.50
WstA: Westola-----	88	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.50

Table 14a.--Construction Materials, Part I--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
YmrA: Yomont-----	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
YmtA: Yomont-----	94	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 14b.--Construction Materials, Part II

[The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table]

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AbbA: Abbie-----	100	Fair Low content of organic matter Water erosion	0.12 0.99	Good		Good	
AbbB: Abbie-----	95	Fair Low content of organic matter Water erosion	0.12 0.99	Good		Good	
AbbB2: Abbie-----	100	Fair Low content of organic matter Water erosion	0.12 0.99	Good		Good	
AbbC: Abbie-----	95	Fair Low content of organic matter Water erosion	0.12 0.99	Good		Good	
AbbC2: Abbie-----	100	Fair Low content of organic matter Water erosion	0.12 0.99	Good		Good	
AbsB: Abilene-----	85	Poor Too clayey Low content of organic matter Carbonate content Water erosion	0.00 0.60 0.68 0.99	Poor Low strength Shrink-swell	0.00 0.87	Poor Too clayey Carbonate content	0.00 0.68
AclA: Abbie-----	87	Fair Low content of organic matter	0.12	Good		Good	
AflB: Abbie-----	100	Fair Low content of organic matter	0.12	Good		Fair Rock fragments	0.97
AflC: Abbie-----	100	Fair Low content of organic matter	0.12	Good		Good	

Table 14b.--Construction Materials, Part II--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BdaB: Berda-----	84	Fair Low content of organic matter	0.18	Good		Good	
BdaC: Berda-----	80	Fair Low content of organic matter	0.18	Good		Good	
BdaD: Berda-----	100	Fair Low content of organic matter	0.18	Good		Good	
CRVE: Cottonwood-----	37	Poor Droughty Depth to bedrock Low content of organic matter Carbonate content	0.00 0.00 0.88 0.97	Poor Depth to bedrock	0.00	Poor Depth to bedrock Carbonate content	0.00 0.97
Rock outcrop-----	28	Not rated		Not rated		Not rated	
Vinson-----	12	Fair Low content of organic matter Depth to bedrock Water erosion	0.12 0.84 0.99	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.87	Fair Hard to reclaim Depth to bedrock	0.05 0.84
DAM: Dam-----	100	Not rated		Not rated		Not rated	
DevE: Devol-----	100	Poor Wind erosion Too sandy Low content of organic matter	0.00 0.00 0.12	Good		Poor Too sandy Slope	0.00 0.84
DpwB: Deepwood-----	82	Fair Low content of organic matter Water erosion	0.12 0.99	Good		Good	
DpwC: Deepwood-----	79	Fair Low content of organic matter Water erosion	0.12 0.99	Good		Good	
DpwD: Deepwood-----	90	Fair Low content of organic matter Water erosion	0.12 0.99	Good		Good	

Table 14b.--Construction Materials, Part II--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DpwE: Deepwood-----	89	Fair Low content of organic matter Water erosion	0.12 0.99	Good		Fair Slope	0.84
DvlB: Devol-----	83	Fair Low content of organic matter	0.12	Good		Good	
DvlC: Devol-----	93	Fair Low content of organic matter	0.12	Good		Good	
DvlD: Devol-----	90	Fair Low content of organic matter	0.12	Good		Good	
EdlC: Eda-----	86	Poor Too sandy Wind erosion Low content of organic matter Droughty	0.00 0.00 0.12 0.99	Good		Poor Too sandy	0.00
EdlE: Eda-----	75	Poor Wind erosion Low content of organic matter Too sandy	0.00 0.12 0.26	Good		Fair Too sandy Slope	0.26 0.96
FayB: Farry-----	93	Fair Low content of organic matter	0.12	Good		Good	
FayC: Farry-----	100	Fair Low content of organic matter	0.12	Good		Good	
FoFE: Fortyone-----	70	Poor Too sandy Low content of organic matter	0.00 0.12	Good		Poor Too sandy Rock fragments Hard to reclaim Slope	0.00 0.00 0.68 0.96
Farry-----	30	Fair Low content of organic matter Too sandy	0.12 0.18	Good		Fair Too sandy Slope	0.18 0.96

Table 14b.--Construction Materials, Part II--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FrkA: Frankirk-----	77	Fair Too clayey Water erosion	0.08 0.99	Poor Low strength Shrink-swell	0.00 0.93	Fair Too clayey	0.07
FrkB: Frankirk-----	85	Fair Too clayey Low content of organic matter Water erosion	0.32 0.88 0.99	Fair Low strength	0.22	Fair Too clayey	0.23
FtnB: Fortyone-----	90	Poor Too sandy Low content of organic matter	0.00 0.12	Good		Poor Too sandy Rock fragments Hard to reclaim	0.00 0.00 0.68
FtnC: Fortyone-----	100	Fair Low content of organic matter	0.12	Good		Fair Hard to reclaim Rock fragments	0.68 0.97
FtnD: Fortyone-----	90	Fair Low content of organic matter	0.12	Good		Fair Hard to reclaim Rock fragments	0.68 0.97
GcsA: Gracemore-----	85	Fair Low content of organic matter	0.12	Fair Depth to saturated zone	0.06	Fair Depth to saturated zone	0.06
GdfB: Grandfield-----	94	Fair Low content of organic matter	0.50	Good		Good	
GdfC: Grandfield-----	92	Fair Low content of organic matter	0.50	Good		Good	
GDGE: Grandfield-----	48	Fair Low content of organic matter	0.12	Good		Good	
Devol-----	32	Fair Low content of organic matter	0.12	Good		Good	
Grandmore-----	20	Fair Low content of organic matter	0.32	Poor Low strength Shrink-swell	0.00 0.99	Good	
GdmB: Grandmore-----	86	Fair Low content of organic matter	0.02	Good		Good	



Table 14b.--Construction Materials, Part II--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GfsA: Gracemore-----	100	Poor Too sandy Low content of organic matter Salinity Droughty	0.00 0.12 0.88 0.95	Poor Depth to saturated zone	0.00	Poor Too sandy Salinity Depth to saturated zone	0.00 0.00 0.00
GmrA: Gracemont-----	91	Fair Low content of organic matter	0.12	Poor Depth to saturated zone	0.00	Poor Depth to saturated zone	0.00
GmsA: Gracemont-----	100	Fair Low content of organic matter Salinity	0.12 0.88	Poor Depth to saturated zone	0.00	Poor Salinity Depth to saturated zone	0.00 0.00
GrmA: Gracemore-----	95	Fair Low content of organic matter Salinity	0.12 0.88	Fair Depth to saturated zone	0.06	Poor Salinity Depth to saturated zone	0.00 0.06
HdGB: Hardeman-----	60	Fair Low content of organic matter	0.18	Good		Good	
Grandmore-----	40	Fair Low content of organic matter	0.32	Good		Good	
HdGC: Hardeman-----	70	Fair Low content of organic matter	0.18	Good		Good	
Grandmore-----	25	Fair Low content of organic matter	0.32	Poor Low strength Shrink-swell	0.00 0.99	Good	
HdmB: Hardeman-----	85	Fair Low content of organic matter	0.18	Good		Good	
HdmC: Hardeman-----	90	Fair Low content of organic matter	0.18	Good		Good	
IreA: Irene-----	97	Fair Low content of organic matter Too clayey Water erosion	0.12 0.98 0.99	Fair Shrink-swell	0.96	Fair Too clayey	0.57

Table 14b.--Construction Materials, Part II--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
IreB: Irene-----	100	Fair Low content of organic matter Too clayey Water erosion	0.12 0.98 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Too clayey	0.57
IreC: Irene-----	100	Fair Low content of organic matter Too clayey Water erosion	0.12 0.98 0.99	Poor Low strength Shrink-swell	0.00 0.92	Fair Too clayey	0.57
IreD: Irene-----	100	Fair Low content of organic matter Too clayey Water erosion	0.12 0.98 0.99	Fair Shrink-swell	0.95	Fair Too clayey	0.57
JssF: Jester-----	100	Poor Wind erosion Too sandy Low content of organic matter Droughty	0.00 0.00 0.12 0.30	Good		Poor Too sandy Slope	0.00 0.96
JstC: Jester-----	94	Poor Wind erosion Too sandy Low content of organic matter Droughty	0.00 0.00 0.12 0.40	Good		Poor Too sandy	0.00
KidB: Kingsdown-----	100	Fair Low content of organic matter	0.12	Good		Good	
KiHE: Kingsdown-----	60	Fair Low content of organic matter	0.12	Good		Good	
Hardeman-----	35	Fair Low content of organic matter	0.18	Good		Good	
LgtA: Lugert-----	100	Fair Low content of organic matter Water erosion	0.88 0.99	Good		Good	

Table 14b.--Construction Materials, Part II--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LiJC: Lincoln-----	51	Poor Too sandy Low content of organic matter Droughty	0.00 0.12 0.76	Good		Poor Too sandy	0.00
Jester-----	49	Poor Wind erosion Too sandy Low content of organic matter Droughty	0.00 0.00 0.12 0.38	Good		Poor Too sandy	0.00
LikB: Likes-----	100	Fair Too sandy Low content of organic matter Droughty	0.02 0.18 0.28	Good		Fair Too sandy	0.02
LisA: Lincoln-----	100	Poor Too sandy Low content of organic matter Droughty	0.00 0.12 0.42	Good		Poor Too sandy	0.00
LncA: Lincoln-----	100	Fair Too sandy Low content of organic matter Droughty	0.02 0.12 0.82	Good		Fair Too sandy	0.02
LROE: Laverne-----	70	Poor Droughty Carbonate content Depth to cemented pan	0.00 0.00 0.00	Poor Depth to cemented pan	0.00	Poor Depth to cemented pan Carbonate content Rock fragments	0.00 0.68 0.97
Rock outcrop-----	20	Not rated		Not rated		Not rated	
LshA: Lesho-----	83	Fair Low content of organic matter Too clayey	0.12 0.98	Good		Fair Too clayey	0.93
LsoA: Lincoln-----	83	Poor Too sandy Low content of organic matter Droughty	0.00 0.12 0.59	Good		Poor Too sandy	0.00

Table 14b.--Construction Materials, Part II--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
M-W: Water-----	100	Not rated		Not rated		Not rated	
MLBB: Mobeetie-----	45	Fair Low content of organic matter	0.88	Good		Good	
Likes-----	22	Poor Wind erosion Too sandy Low content of organic matter Droughty	0.00 0.00 0.18 0.27	Good		Poor Too sandy	0.00
Berda-----	21	Fair Low content of organic matter	0.18	Good		Good	
MLBC: Mobeetie-----	45	Fair Low content of organic matter	0.88	Good		Good	
Likes-----	22	Poor Too sandy Low content of organic matter Droughty	0.00 0.18 0.28	Good		Poor Too sandy	0.00
Berda-----	21	Fair Low content of organic matter	0.18	Good		Good	
MLBE: Mobeetie-----	45	Fair Low content of organic matter	0.88	Good		Fair Slope	0.96
Likes-----	22	Fair Too sandy Low content of organic matter Droughty	0.02 0.18 0.28	Good		Fair Too sandy Slope	0.02 0.96
Berda-----	21	Fair Low content of organic matter	0.18	Good		Fair Slope	0.96
MnsB: Mansic-----	94	Fair Low content of organic matter Carbonate content	0.88 0.92	Fair Low strength Shrink-swell	0.22 0.87	Good	
MnsC: Mansic-----	100	Fair Low content of organic matter Carbonate content	0.88 0.92	Fair Low strength Shrink-swell	0.22 0.87	Fair Carbonate content	0.92

Table 14b.--Construction Materials, Part II--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MsnB: Manson-----	95	Fair Low content of organic matter Carbonate content	0.18 0.68	Poor Low strength	0.00	Fair Carbonate content	0.68
MsnC: Manson-----	100	Fair Low content of organic matter Carbonate content	0.18 0.68	Poor Low strength	0.00	Fair Carbonate content	0.68
MsnC2: Manson-----	95	Fair Low content of organic matter Carbonate content	0.18 0.68	Poor Low strength	0.00	Fair Carbonate content	0.68
OMBE: Okklark-----	43	Fair Carbonate content Low content of organic matter	0.46 0.50	Good		Fair Carbonate content Slope	0.80 0.96
Mansic-----	27	Fair Carbonate content Low content of organic matter Water erosion	0.46 0.50 0.99	Good		Fair Carbonate content Slope	0.46 0.96
Berda-----	23	Fair Low content of organic matter Carbonate content	0.12 0.92	Poor Low strength Shrink-swell	0.00 0.87	Fair Carbonate content Slope	0.92 0.96
OMBG: Okklark-----	33	Fair Carbonate content Low content of organic matter	0.46 0.50	Fair Slope	0.08	Poor Slope Carbonate content	0.00 0.46
Mansic-----	26	Fair Low content of organic matter Carbonate content Water erosion	0.12 0.46 0.99	Fair Slope	0.08	Poor Slope Carbonate content	0.00 0.46
Berda-----	25	Fair Low content of organic matter	0.18	Poor Slope	0.00	Poor Slope	0.00
PdoA: Paloduro-----	100	Fair Low content of organic matter	0.18	Good		Good	
PdoB: Paloduro-----	100	Fair Low content of organic matter	0.18	Good		Good	

Table 14b.--Construction Materials, Part II--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PdoC2: Paloduro-----	90	Fair Low content of organic matter	0.18	Good		Good	
PIT: Pits-----	100	Not rated		Not rated		Not rated	
PlmB: Plemons-----	100	Fair Low content of organic matter Carbonate content	0.18 0.68	Poor Low strength Shrink-swell	0.00 0.87	Fair Carbonate content	0.68
PlmC: Plemons-----	100	Fair Low content of organic matter Carbonate content	0.18 0.32	Poor Low strength Shrink-swell	0.00 0.87	Fair Carbonate content	0.32
PlmD: Plemons-----	90	Fair Low content of organic matter Carbonate content	0.18 0.32	Poor Low strength Shrink-swell	0.00 0.87	Fair Carbonate content	0.32
QnWC3: Quinlan-----	67	Poor Droughty Depth to bedrock Low content of organic matter Water erosion	0.00 0.00 0.88 0.99	Poor Depth to bedrock	0.00	Poor Hard to reclaim Depth to bedrock	0.00 0.00
Woodward-----	33	Fair Low content of organic matter Depth to bedrock Droughty Water erosion	0.12 0.54 0.99 0.99	Poor Depth to bedrock	0.00	Fair Depth to bedrock Hard to reclaim	0.54 0.54
QnWD: Quinlan-----	48	Poor Depth to bedrock Droughty Low content of organic matter Water erosion	0.00 0.00 0.88 0.99	Poor Depth to bedrock	0.00	Poor Hard to reclaim Depth to bedrock	0.00 0.00
Woodward-----	30	Fair Low content of organic matter Depth to bedrock Droughty Water erosion	0.12 0.16 0.75 0.99	Poor Depth to bedrock	0.00	Poor Hard to reclaim Depth to bedrock	0.00 0.16

Table 14b.--Construction Materials, Part II--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
QnWE: Quinlan-----	72	Poor Depth to bedrock Droughty Low content of organic matter Water erosion	0.00 0.00 0.88 0.99	Poor Depth to bedrock	0.00	Poor Hard to reclaim Depth to bedrock Slope	0.00 0.00 0.96
Woodward-----	24	Fair Depth to bedrock Low content of organic matter Droughty Water erosion	0.03 0.12 0.37 0.99	Poor Depth to bedrock	0.00	Poor Hard to reclaim Depth to bedrock Slope	0.00 0.03 0.96
QRWG: Quinlan-----	50	Poor Depth to bedrock Droughty Low content of organic matter Water erosion	0.00 0.00 0.88 0.99	Poor Depth to bedrock Slope	0.00 0.00	Poor Hard to reclaim Depth to bedrock Slope	0.00 0.00 0.00
Rock outcrop-----	33	Not rated		Not rated		Not rated	
Woodward-----	17	Fair Depth to bedrock Low content of organic matter Droughty Water erosion	0.03 0.12 0.38 0.99	Poor Depth to bedrock	0.00	Poor Hard to reclaim Depth to bedrock Slope	0.00 0.03 0.16
QRYG: Quinlan-----	41	Poor Depth to bedrock Droughty Low content of organic matter Water erosion	0.00 0.00 0.88 0.99	Poor Depth to bedrock Slope	0.00 0.08	Poor Hard to reclaim Depth to bedrock Slope	0.00 0.00 0.00
Rock outcrop-----	18	Not rated		Not rated		Not rated	
Yomont-----	17	Fair Low content of organic matter Water erosion	0.18 0.68	Good		Good	
QWDE: Quinlan-----	41	Poor Depth to bedrock Droughty Low content of organic matter Water erosion	0.00 0.00 0.88 0.99	Poor Depth to bedrock	0.00	Poor Hard to reclaim Depth to bedrock Slope	0.00 0.00 0.96
Woodward-----	38	Fair Depth to bedrock Droughty Water erosion	0.16 0.60 0.99	Poor Depth to bedrock	0.00	Poor Hard to reclaim Depth to bedrock Slope	0.00 0.16 0.96

Table 14b.--Construction Materials, Part II--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
QWDE: Deepwood-----	12	Fair Low content of organic matter Water erosion	0.12 0.99	Good		Fair Slope	0.96
QWRC: Quinlan-----	58	Poor Depth to bedrock Droughty Low content of organic matter Water erosion	0.00 0.00 0.88 0.99	Poor Depth to bedrock	0.00	Poor Hard to reclaim Depth to bedrock	0.00 0.00
Woodward-----	23	Fair Low content of organic matter Depth to bedrock Water erosion	0.12 0.99 0.99	Poor Depth to bedrock	0.00	Poor Hard to reclaim Depth to bedrock	0.00 0.99
Rock outcrop-----	10	Not rated		Not rated		Not rated	
RoCH: Rock outcrop-----	55	Not rated		Not rated		Not rated	
Cottonwood-----	30	Poor Droughty Depth to bedrock Low content of organic matter Carbonate content	0.00 0.00 0.88 0.97	Poor Depth to bedrock Slope	0.00 0.98	Poor Depth to bedrock Slope Carbonate content	0.00 0.00 0.97
RssA: Rosston-----	100	Poor Too clayey Low content of organic matter	0.00 0.60	Poor Depth to saturated zone Shrink-swell Low strength	0.00 0.00 0.00	Poor Too clayey Depth to saturated zone	0.00 0.00
SAL: Salt flats-----	100	Not rated		Not rated		Not rated	
SelA: Selman-----	96	Fair Low content of organic matter Water erosion	0.50 0.99	Fair Shrink-swell	0.99	Good	
SelB: Selman-----	92	Fair Low content of organic matter Water erosion	0.50 0.99	Poor Low strength Shrink-swell	0.00 0.93	Good	
SelC: Selman-----	87	Fair Low content of organic matter Water erosion	0.50 0.99	Poor Low strength Shrink-swell	0.00 0.94	Good	



Table 14b.--Construction Materials, Part II--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SelC2: Selman-----	100	Fair Low content of organic matter Water erosion	0.50 0.99	Fair Shrink-swell	0.97	Good	
SelD: Selman-----	94	Fair Low content of organic matter Water erosion	0.50 0.99	Poor Low strength Shrink-swell	0.00 0.93	Good	
SelD2: Selman-----	81	Fair Low content of organic matter Water erosion	0.12 0.99	Fair Shrink-swell	0.98	Good	
SprA: Spur-----	87	Fair Low content of organic matter Water erosion	0.88 0.99	Poor Low strength Shrink-swell	0.00 0.87	Good	
SpsA: Spur-----	100	Fair Low content of organic matter Water erosion	0.88 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Salinity	0.50
StpA: St. Paul-----	92	Fair Too clayey Water erosion	0.76 0.99	Poor Low strength Shrink-swell	0.00 0.90	Fair Too clayey	0.63
StpB: St. Paul-----	93	Fair Low content of organic matter Water erosion	0.50 0.99	Poor Low strength Shrink-swell	0.00 0.90	Good	
StpC: St. Paul-----	95	Fair Low content of organic matter Too clayey Water erosion	0.50 0.98 0.99	Poor Low strength Shrink-swell	0.00 0.96	Fair Too clayey	0.93
StpD: St. Paul-----	96	Fair Too clayey Water erosion	0.76 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Too clayey	0.63
TeWE: Teagard-----	53	Poor Too clayey Depth to bedrock Water erosion Droughty	0.00 0.54 0.90 0.96	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.12	Poor Hard to reclaim Too clayey Depth to bedrock	0.00 0.00 0.54

Table 14b.--Construction Materials, Part II--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TeWE: Wellsford-----	33	Poor Droughty Depth to bedrock Too clayey Low content of organic matter Sodium content	0.00 0.00 0.00 0.88 0.97	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.12	Poor Hard to reclaim Depth to bedrock Too clayey Sodium content	0.00 0.00 0.00 0.98
TexA: Texroy-----	100	Good		Poor Low strength	0.00	Good	
TexB: Texroy-----	100	Good		Poor Low strength	0.00	Good	
TexC: Texroy-----	100	Fair Low content of organic matter	0.88	Poor Low strength	0.00	Good	
TipA: Tipton-----	95	Fair Low content of organic matter Water erosion	0.88 0.99	Poor Low strength	0.00	Good	
TipB: Tipton-----	100	Fair Low content of organic matter Water erosion	0.88 0.99	Poor Low strength	0.00	Good	
TipC: Tipton-----	100	Fair Water erosion	0.99	Poor Low strength	0.00	Good	
TipD: Tipton-----	87	Fair Low content of organic matter Water erosion	0.88 0.99	Poor Low strength	0.00	Good	
TRQC: Talpa-----	53	Poor Droughty Depth to bedrock Carbonate content	0.00 0.00 0.68	Poor Depth to bedrock Low strength	0.00 0.00	Poor Depth to bedrock Carbonate content	0.00 0.68
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Quinlan-----	22	Poor Depth to bedrock Droughty Low content of organic matter Water erosion	0.00 0.00 0.88 0.99	Poor Depth to bedrock	0.00	Poor Hard to reclaim Depth to bedrock	0.00 0.00

Table 14b.--Construction Materials, Part II--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Tv1C: Tivoli-----	85	Poor Too sandy Wind erosion Low content of organic matter Droughty	0.00 0.00 0.12 0.40	Good		Poor Too sandy	0.00
Tv1E: Tivoli-----	88	Poor Wind erosion Low content of organic matter Too sandy Droughty	0.00 0.12 0.16 0.56	Good		Fair Too sandy Slope	0.16 0.96
Tv1G: Tivoli-----	97	Poor Wind erosion Low content of organic matter Too sandy Droughty	0.00 0.12 0.20 0.42	Poor Slope	0.00	Poor Slope Too sandy	0.00 0.20
VerB: Vernon-----	75	Poor Too clayey Sodium content Droughty Low content of organic matter Depth to bedrock Water erosion	0.00 0.40 0.55 0.60 0.84 0.90	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.12	Poor Too clayey Hard to reclaim Sodium content Depth to bedrock	0.00 0.00 0.40 0.84
VerC: Vernon-----	69	Poor Too clayey Sodium content Low content of organic matter Droughty Water erosion Depth to bedrock	0.00 0.40 0.60 0.65 0.90 0.90	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.12	Poor Too clayey Hard to reclaim Sodium content Depth to bedrock	0.00 0.00 0.40 0.90
VerD: Vernon-----	80	Poor Too clayey Droughty Depth to bedrock Sodium content Low content of organic matter Water erosion	0.00 0.06 0.21 0.40 0.60 0.90	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.12	Poor Too clayey Hard to reclaim Depth to bedrock Sodium content	0.00 0.00 0.21 0.40

Table 14b.--Construction Materials, Part II--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
VrrB: Vernon-----	86	Fair Too clayey Low content of organic matter Droughty Water erosion Depth to bedrock	 0.08 0.18  0.89 0.90 0.99	Poor Depth to bedrock Low strength Shrink-swell	 0.00 0.00 0.12	Poor Hard to reclaim Too clayey Depth to bedrock	 0.00 0.05 0.99
VrrC: Vernon-----	76	Fair Droughty Water erosion Depth to bedrock	 0.85 0.90 0.97	Poor Depth to bedrock Low strength Shrink-swell	 0.00 0.00 0.44	Fair Hard to reclaim Depth to bedrock	 0.03 0.97
W: Water-----	100	Not rated		Not rated		Not rated	
WodA: Woods-----	80	Fair Carbonate content Too clayey Low content of organic matter Water erosion	 0.46 0.76 0.88 0.90	Poor Low strength Shrink-swell	 0.00 0.20	Fair Too clayey	 0.76
WodB: Woods-----	86	Poor Too clayey Carbonate content Low content of organic matter Water erosion	 0.00 0.46 0.88 0.90	Poor Low strength Shrink-swell	 0.00 0.14	Poor Too clayey	 0.00
WodC: Woods-----	100	Poor Too clayey Carbonate content Water erosion	 0.00 0.46 0.90	Poor Low strength Shrink-swell	 0.00 0.16	Poor Too clayey	 0.00
WQHE: Westola-----	48	Fair Low content of organic matter	 0.12	Good		Good	
Quinlan-----	30	Poor Depth to bedrock Droughty Low content of organic matter Water erosion	 0.00 0.00 0.88 0.99	Poor Depth to bedrock	 0.00	Poor Hard to reclaim Depth to bedrock	 0.00 0.00
Hardeman-----	22	Fair Low content of organic matter	 0.18	Good		Good	

Table 14b.--Construction Materials, Part II--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WQnB: Woodward-----	45	Fair Low content of organic matter Depth to bedrock Droughty Water erosion	0.12 0.16 0.75 0.99	Poor Depth to bedrock	0.00	Poor Hard to reclaim Depth to bedrock	0.00 0.16
Quinlan-----	43	Poor Depth to bedrock Droughty Low content of organic matter Water erosion	0.00 0.00 0.88 0.99	Poor Depth to bedrock	0.00	Poor Hard to reclaim Depth to bedrock	0.00 0.00
WQnC: Woodward-----	56	Fair Low content of organic matter Depth to bedrock Water erosion Droughty	0.12 0.54 0.99 0.99	Poor Depth to bedrock	0.00	Fair Depth to bedrock Hard to reclaim	0.54 0.54
Quinlan-----	22	Poor Depth to bedrock Droughty Low content of organic matter Water erosion	0.00 0.00 0.88 0.99	Poor Depth to bedrock	0.00	Poor Hard to reclaim Depth to bedrock	0.00 0.00
WslA: Westola-----	75	Poor Too sandy Low content of organic matter	0.00 0.12	Good		Poor Too sandy	0.00
WstA: Westola-----	88	Fair Low content of organic matter	0.12	Good		Good	
YmrA: Yomont-----	100	Fair Low content of organic matter Water erosion	0.18 0.68	Good		Good	
YmtA: Yomont-----	94	Fair Low content of organic matter Water erosion	0.18 0.68	Good		Good	

## Water Management

Table 15 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

*Pond reservoir areas* hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

*Embankments, dikes, and levees* are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

*Aquifer-fed excavated ponds* are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Table 15.--Water Management

[The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table]

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AbbA: Abbie-----	100	Very limited Seepage	1.00	Very limited Piping	0.99	Very limited Depth to water	1.00
AbbB: Abbie-----	95	Very limited Seepage	1.00	Somewhat limited Piping	0.90	Very limited Depth to water	1.00
AbbB2: Abbie-----	100	Very limited Seepage	1.00	Very limited Piping	1.00	Very limited Depth to water	1.00
AbbC: Abbie-----	95	Very limited Seepage	1.00	Somewhat limited Piping	0.97	Very limited Depth to water	1.00
AbbC2: Abbie-----	100	Very limited Seepage	1.00	Somewhat limited Piping Seepage	0.97 0.04	Very limited Depth to water	1.00
AbsB: Abilene-----	85	Somewhat limited Seepage	0.04	Not limited		Very limited Depth to water	1.00
AclA: Abbie-----	87	Very limited Seepage	1.00	Somewhat limited Piping	0.90	Very limited Depth to water	1.00
AflB: Abbie-----	100	Very limited Seepage	1.00	Very limited Piping	1.00	Very limited Depth to water	1.00
AflC: Abbie-----	100	Very limited Seepage	1.00	Very limited Piping Seepage	1.00 0.04	Very limited Depth to water	1.00
BdaB: Berda-----	84	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.76	Very limited Depth to water	1.00
BdaC: Berda-----	80	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.76	Very limited Depth to water	1.00
BdaD: Berda-----	100	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.76	Very limited Depth to water	1.00
CRVE: Cottonwood-----	37	Somewhat limited Depth to bedrock	0.90	Very limited Thin layer Piping	1.00 1.00	Very limited Depth to water	1.00

Table 15.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CRVE: Rock outcrop-----	28	Not rated		Not rated		Not rated	
Vinson-----	12	Somewhat limited Seepage Depth to bedrock	0.72 0.05	Somewhat limited Piping Thin layer	0.98 0.74	Very limited Depth to water	1.00
DAM: Dam-----	100	Not rated		Not rated		Not rated	
DevE: Devol-----	100	Very limited Seepage	1.00	Somewhat limited Seepage	0.06	Very limited Depth to water	1.00
DpwB: Deepwood-----	82	Somewhat limited Seepage	0.72	Very limited Piping	1.00	Very limited Depth to water	1.00
DpwC: Deepwood-----	79	Somewhat limited Seepage	0.72	Very limited Piping	1.00	Very limited Depth to water	1.00
DpwD: Deepwood-----	90	Somewhat limited Seepage	0.72	Very limited Piping	1.00	Very limited Depth to water	1.00
DpwE: Deepwood-----	89	Somewhat limited Seepage	0.72	Very limited Piping	1.00	Very limited Depth to water	1.00
DvlB: Devol-----	83	Very limited Seepage	1.00	Somewhat limited Seepage	0.05	Very limited Depth to water	1.00
DvlC: Devol-----	93	Very limited Seepage	1.00	Somewhat limited Seepage	0.05	Very limited Depth to water	1.00
DvlD: Devol-----	90	Very limited Seepage	1.00	Somewhat limited Seepage	0.05	Very limited Depth to water	1.00
EdlC: Eda-----	86	Very limited Seepage	1.00	Somewhat limited Seepage	0.26	Very limited Depth to water	1.00
EdlE: Eda-----	75	Very limited Seepage	1.00	Somewhat limited Seepage	0.69	Very limited Depth to water	1.00
FayB: Farry-----	93	Very limited Seepage	1.00	Somewhat limited Seepage	0.02	Very limited Depth to water	1.00
FayC: Farry-----	100	Very limited Seepage	1.00	Somewhat limited Seepage	0.03	Very limited Depth to water	1.00



Table 15.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FoFE: Fortyone-----	70	Very limited Seepage	1.00	Somewhat limited Seepage	0.11	Very limited Depth to water	1.00
Farry-----	30	Very limited Seepage	1.00	Somewhat limited Seepage	0.17	Very limited Depth to water	1.00
FrkA: Frankirk-----	77	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.03	Very limited Depth to water	1.00
FrkB: Frankirk-----	85	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.16	Very limited Depth to water	1.00
FtnB: Fortyone-----	90	Very limited Seepage	1.00	Somewhat limited Seepage	0.34	Very limited Depth to water	1.00
FtnC: Fortyone-----	100	Very limited Seepage	1.00	Somewhat limited Seepage	0.42	Very limited Depth to water	1.00
FtnD: Fortyone-----	90	Very limited Seepage	1.00	Somewhat limited Seepage	0.17	Very limited Depth to water	1.00
GcsA: Gracemore-----	85	Very limited Seepage	1.00	Very limited Depth to saturated zone	1.00	Very limited Cutbanks cave	1.00
GdfB: Grandfield-----	94	Very limited Seepage	1.00	Somewhat limited Seepage	0.04	Very limited Depth to water	1.00
GdfC: Grandfield-----	92	Very limited Seepage	1.00	Somewhat limited Seepage	0.04	Very limited Depth to water	1.00
GDGE: Grandfield-----	48	Very limited Seepage	1.00	Not limited		Very limited Depth to water	1.00
Devol-----	32	Very limited Seepage	1.00	Somewhat limited Seepage	0.06	Very limited Depth to water	1.00
Grandmore-----	20	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.28	Very limited Depth to water	1.00
GdmB: Grandmore-----	86	Somewhat limited Seepage	0.72	Very limited Piping	1.00	Very limited Depth to water	1.00
GfsA: Gracemore-----	100	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage Salinity	1.00 0.13 0.12	Very limited Cutbanks cave Salty water	1.00 0.50

Table 15.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GmrA: Gracemont-----	91	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping	1.00 1.00	Somewhat limited Cutbanks cave	0.10
GmsA: Gracemont-----	100	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping Salinity Seepage	1.00 1.00 0.12 0.12	Very limited Cutbanks cave Salty water	1.00 0.50
GrmA: Gracemore-----	95	Very limited Seepage	1.00	Very limited Depth to saturated zone Salinity	1.00 0.12	Very limited Cutbanks cave Salty water	1.00 0.50
HdGB: Hardeman-----	60	Very limited Seepage	1.00	Somewhat limited Seepage	0.12	Very limited Depth to water	1.00
Grandmore-----	40	Somewhat limited Seepage	0.72	Very limited Piping	0.99	Very limited Depth to water	1.00
HdGC: Hardeman-----	70	Very limited Seepage	1.00	Not limited		Very limited Depth to water	1.00
Grandmore-----	25	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.61	Very limited Depth to water	1.00
HdmB: Hardeman-----	85	Very limited Seepage	1.00	Not limited		Very limited Depth to water	1.00
HdmC: Hardeman-----	90	Very limited Seepage	1.00	Not limited		Very limited Depth to water	1.00
IreA: Irene-----	97	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.84	Very limited Depth to water	1.00
IreB: Irene-----	100	Somewhat limited Seepage	0.04	Somewhat limited Piping	0.50	Very limited Depth to water	1.00
IreC: Irene-----	100	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.84	Very limited Depth to water	1.00
IreD: Irene-----	100	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.86	Very limited Depth to water	1.00

Table 15.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
JssF: Jester-----	100	Very limited Seepage	1.00	Somewhat limited Seepage	0.36	Very limited Depth to water	1.00
JstC: Jester-----	94	Very limited Seepage	1.00	Somewhat limited Seepage	0.12	Very limited Depth to water	1.00
KidB: Kingsdown-----	100	Very limited Seepage	1.00	Somewhat limited Seepage	0.01	Very limited Depth to water	1.00
KiHE: Kingsdown-----	60	Very limited Seepage	1.00	Somewhat limited Seepage	0.06	Very limited Depth to water	1.00
Hardeman-----	35	Very limited Seepage	1.00	Not limited		Very limited Depth to water	1.00
LgtA: Lugert-----	100	Somewhat limited Seepage	0.72	Very limited Piping	1.00	Very limited Depth to water	1.00
LiJC: Lincoln-----	51	Very limited Seepage	1.00	Somewhat limited Seepage	0.21	Very limited Depth to water	1.00
Jester-----	49	Very limited Seepage	1.00	Somewhat limited Seepage	0.07	Very limited Depth to water	1.00
LikB: Likes-----	100	Very limited Seepage	1.00	Somewhat limited Seepage	0.06	Very limited Depth to water	1.00
LisA: Lincoln-----	100	Very limited Seepage	1.00	Somewhat limited Seepage	0.30	Very limited Depth to water	1.00
LncA: Lincoln-----	100	Very limited Seepage	1.00	Somewhat limited Seepage	0.21	Very limited Depth to water	1.00
LROE: Laverne-----	70	Very limited Depth to cemented pan Seepage	1.00 0.02	Very limited Thin layer Piping	1.00 0.99	Very limited Depth to water	1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
LshA: Lesho-----	83	Very limited Seepage	1.00	Somewhat limited Depth to saturated zone Seepage	0.43 0.10	Very limited Cutbanks cave Depth to water	1.00 0.25
LsoA: Lincoln-----	83	Very limited Seepage	1.00	Somewhat limited Seepage	0.11	Very limited Depth to water	1.00

Table 15.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
M-W: Water-----	100	Not rated		Not rated		Not rated	
MLBB: Mobeetie-----	45	Very limited Seepage	1.00	Somewhat limited Seepage	0.26	Very limited Depth to water	1.00
Likes-----	22	Very limited Seepage	1.00	Somewhat limited Seepage	0.21	Very limited Depth to water	1.00
Berda-----	21	Somewhat limited Seepage	0.72	Somewhat limited Seepage	0.02	Very limited Depth to water	1.00
MLBC: Mobeetie-----	45	Very limited Seepage	1.00	Somewhat limited Seepage	0.26	Very limited Depth to water	1.00
Likes-----	22	Very limited Seepage	1.00	Somewhat limited Seepage	0.21	Very limited Depth to water	1.00
Berda-----	21	Somewhat limited Seepage	0.72	Somewhat limited Piping Seepage	0.80 0.06	Very limited Depth to water	1.00
MLBE: Mobeetie-----	45	Very limited Seepage	1.00	Somewhat limited Seepage	0.26	Very limited Depth to water	1.00
Likes-----	22	Very limited Seepage	1.00	Somewhat limited Seepage	0.21	Very limited Depth to water	1.00
Berda-----	21	Somewhat limited Seepage	0.72	Somewhat limited Piping Seepage	0.79 0.20	Very limited Depth to water	1.00
MnsB: Mansic-----	94	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.42	Very limited Depth to water	1.00
MnsC: Mansic-----	100	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.46	Very limited Depth to water	1.00
MsnB: Manson-----	95	Somewhat limited Seepage	0.72	Not limited		Very limited Depth to water	1.00
MsnC: Manson-----	100	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.01	Very limited Depth to water	1.00
MsnC2: Manson-----	95	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.01	Very limited Depth to water	1.00
OMBE: Oklark-----	43	Very limited Seepage	1.00	Very limited Piping Seepage	1.00 0.04	Very limited Depth to water	1.00

Table 15.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
OMBE:							
Mansic-----	27	Very limited Seepage	1.00	Somewhat limited Piping	0.86	Very limited Depth to water	1.00
Berda-----	23	Somewhat limited Seepage	0.72	Somewhat limited Piping Seepage	0.22 0.01	Very limited Depth to water	1.00
OMBG:							
Oklark-----	33	Very limited Seepage Slope	1.00 0.21	Very limited Piping Seepage	1.00 0.03	Very limited Depth to water	1.00
Mansic-----	26	Very limited Seepage Slope	1.00 0.21	Somewhat limited Piping Seepage	0.94 0.02	Very limited Depth to water	1.00
Berda-----	25	Somewhat limited Seepage Slope	0.72 0.64	Somewhat limited Piping	0.76	Very limited Depth to water	1.00
PdoA:							
Paloduro-----	100	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.64	Very limited Depth to water	1.00
PdoB:							
Paloduro-----	100	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.66	Very limited Depth to water	1.00
PdoC2:							
Paloduro-----	90	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.64	Very limited Depth to water	1.00
PIT:							
Pits-----	100	Not rated		Not rated		Not rated	
PlmB:							
Plemons-----	100	Somewhat limited Seepage	0.72	Not limited		Very limited Depth to water	1.00
PlmC:							
Plemons-----	100	Somewhat limited Seepage	0.72	Not limited		Very limited Depth to water	1.00
PlmD:							
Plemons-----	90	Somewhat limited Seepage	0.72	Not limited		Very limited Depth to water	1.00
QnWC3:							
Quinlan-----	67	Somewhat limited Depth to bedrock	0.74	Very limited Thin layer Piping	1.00 1.00	Very limited Depth to water	1.00
Woodward-----	33	Somewhat limited Seepage Depth to bedrock	0.72 0.11	Very limited Piping Thin layer	1.00 0.86	Very limited Depth to water	1.00

Table 15.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
QnWD:							
Quinlan-----	48	Somewhat limited Depth to bedrock Seepage	0.66 0.04	Very limited Thin layer Piping	1.00 1.00	Very limited Depth to water	1.00
Woodward-----	30	Somewhat limited Seepage Depth to bedrock	0.72 0.26	Very limited Piping Thin layer	1.00 0.96	Very limited Depth to water	1.00
QnWE:							
Quinlan-----	72	Somewhat limited Depth to bedrock Seepage	0.53 0.04	Very limited Thin layer Piping	1.00 1.00	Very limited Depth to water	1.00
Woodward-----	24	Somewhat limited Seepage Depth to bedrock	0.72 0.37	Very limited Piping Thin layer	1.00 0.99	Very limited Depth to water	1.00
QRWG:							
Quinlan-----	50	Somewhat limited Depth to bedrock Slope	0.74 0.28	Very limited Thin layer Piping	1.00 1.00	Very limited Depth to water	1.00
Rock outcrop-----	33	Not rated		Not rated		Not rated	
Woodward-----	17	Somewhat limited Seepage Depth to bedrock Slope	0.72 0.37 0.01	Very limited Piping Thin layer	1.00 0.99	Very limited Depth to water	1.00
QRYG:							
Quinlan-----	41	Somewhat limited Depth to bedrock Slope	0.69 0.21	Very limited Thin layer Piping	1.00 1.00	Very limited Depth to water	1.00
Rock outcrop-----	18	Not rated		Not rated		Not rated	
Yomont-----	17	Very limited Seepage	1.00	Very limited Piping	1.00	Very limited Depth to water	1.00
QWDE:							
Quinlan-----	41	Somewhat limited Depth to bedrock Seepage	0.61 0.04	Very limited Thin layer Piping	1.00 1.00	Very limited Depth to water	1.00
Woodward-----	38	Somewhat limited Seepage Depth to bedrock	0.72 0.26	Very limited Piping Thin layer	1.00 0.96	Very limited Depth to water	1.00
Deepwood-----	12	Somewhat limited Seepage	0.72	Very limited Piping	1.00	Very limited Depth to water	1.00
QWRC:							
Quinlan-----	58	Somewhat limited Depth to bedrock	0.69	Very limited Thin layer Piping	1.00 1.00	Very limited Depth to water	1.00

Table 15.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
QWRC: Woodward-----	23	Somewhat limited Seepage Depth to bedrock	0.72 0.02	Very limited Piping Thin layer	1.00 0.56	Very limited Depth to water	1.00
Rock outcrop-----	10	Not rated		Not rated		Not rated	
RoCH: Rock outcrop-----	55	Not rated		Not rated		Not rated	
Cottonwood-----	30	Somewhat limited Depth to bedrock Slope	0.87 0.04	Very limited Thin layer Piping	1.00 1.00	Very limited Depth to water	1.00
RssA: Rosston-----	100	Not limited		Very limited Depth to saturated zone Hard to pack Ponding	1.00 1.00 1.00	Very limited Slow refill Cutbanks cave	1.00 0.10
SAL: Salt flats-----	100	Not rated		Not rated		Not rated	
SelA: Selman-----	96	Somewhat limited Seepage	0.72	Very limited Piping	1.00	Very limited Depth to water	1.00
SelB: Selman-----	92	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.97	Very limited Depth to water	1.00
SelC: Selman-----	87	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.98	Very limited Depth to water	1.00
SelC2: Selman-----	100	Somewhat limited Seepage	0.72	Very limited Piping	0.99	Very limited Depth to water	1.00
SelD: Selman-----	94	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.97	Very limited Depth to water	1.00
SelD2: Selman-----	81	Somewhat limited Seepage	0.72	Very limited Piping	0.99	Very limited Depth to water	1.00
SprA: Spur-----	87	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.14	Very limited Depth to water	1.00
SpsA: Spur-----	100	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.18	Very limited Depth to water	1.00
StpA: St. Paul-----	92	Somewhat limited Seepage	0.04	Somewhat limited Piping	0.29	Very limited Depth to water	1.00

Table 15.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
StpB: St. Paul-----	93	Somewhat limited Seepage	0.54	Somewhat limited Piping	0.70	Very limited Depth to water	1.00
StpC: St. Paul-----	95	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.40	Very limited Depth to water	1.00
StpD: St. Paul-----	96	Somewhat limited Seepage	0.54	Somewhat limited Piping	0.44	Very limited Depth to water	1.00
TeWE: Teagard-----	53	Somewhat limited Depth to bedrock	0.11	Somewhat limited Thin layer	0.86	Very limited Depth to water	1.00
Wellsford-----	33	Somewhat limited Depth to bedrock	0.66	Very limited Thin layer Hard to pack	1.00 0.23	Very limited Depth to water	1.00
TexA: Texroy-----	100	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.18	Very limited Depth to water	1.00
TexB: Texroy-----	100	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.16	Very limited Depth to water	1.00
TexC: Texroy-----	100	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.17	Very limited Depth to water	1.00
TipA: Tipton-----	95	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.89	Very limited Depth to water	1.00
TipB: Tipton-----	100	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.86	Very limited Depth to water	1.00
TipC: Tipton-----	100	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.98	Very limited Depth to water	1.00
TipD: Tipton-----	87	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.98	Very limited Depth to water	1.00
TRQC: Talpa-----	53	Very limited Depth to bedrock	1.00	Very limited Thin layer Piping	1.00 0.08	Very limited Depth to water	1.00
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Quinlan-----	22	Somewhat limited Depth to bedrock	0.69	Very limited Thin layer Piping	1.00 1.00	Very limited Depth to water	1.00



Table 15.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Tv1C: Tivoli-----	85	Very limited Seepage	1.00	Somewhat limited Seepage	0.31	Very limited Depth to water	1.00
Tv1E: Tivoli-----	88	Very limited Seepage	1.00	Somewhat limited Seepage	0.25	Very limited Depth to water	1.00
Tv1G: Tivoli-----	97	Very limited Seepage Slope	1.00 0.45	Somewhat limited Seepage	0.03	Very limited Depth to water	1.00
VerB: Vernon-----	75	Somewhat limited Depth to bedrock	0.05	Somewhat limited Thin layer Piping	0.74 0.60	Very limited Depth to water	1.00
VerC: Vernon-----	69	Somewhat limited Depth to bedrock	0.04	Somewhat limited Thin layer Piping	0.70 0.60	Very limited Depth to water	1.00
VerD: Vernon-----	80	Somewhat limited Depth to bedrock	0.23	Somewhat limited Thin layer Piping	0.95 0.60	Very limited Depth to water	1.00
VrrB: Vernon-----	86	Somewhat limited Depth to bedrock	0.01	Somewhat limited Thin layer	0.52	Very limited Depth to water	1.00
VrrC: Vernon-----	76	Somewhat limited Seepage Depth to bedrock	0.04 0.02	Somewhat limited Thin layer Seepage Piping	0.61 0.04 0.01	Very limited Depth to water	1.00
W: Water-----	100	Not rated		Not rated		Not rated	
WodA: Woods-----	80	Somewhat limited Seepage	0.02	Not limited		Very limited Depth to water	1.00
WodB: Woods-----	86	Somewhat limited Seepage	0.02	Not limited		Very limited Depth to water	1.00
WodC: Woods-----	100	Somewhat limited Seepage	0.02	Not limited		Very limited Depth to water	1.00
WQHE: Westola-----	48	Very limited Seepage	1.00	Very limited Piping Seepage	1.00 0.01	Very limited Depth to water	1.00

Table 15.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WQHE: Quinlan-----	30	Somewhat limited Depth to bedrock	0.66	Very limited Thin layer Piping	1.00 1.00	Very limited Depth to water	1.00
Hardeman-----	22	Very limited Seepage	1.00	Not limited		Very limited Depth to water	1.00
WQnB: Woodward-----	45	Somewhat limited Seepage Depth to bedrock	0.72 0.26	Very limited Piping Thin layer	1.00 0.96	Very limited Depth to water	1.00
Quinlan-----	43	Somewhat limited Depth to bedrock Seepage	0.53 0.04	Very limited Thin layer Piping	1.00 1.00	Very limited Depth to water	1.00
WQnC: Woodward-----	56	Somewhat limited Seepage Depth to bedrock	0.72 0.11	Very limited Piping Thin layer	1.00 0.86	Very limited Depth to water	1.00
Quinlan-----	22	Somewhat limited Depth to bedrock	0.74	Very limited Thin layer Piping	1.00 1.00	Very limited Depth to water	1.00
WslA: Westola-----	75	Very limited Seepage	1.00	Very limited Piping Seepage	1.00 0.50	Very limited Depth to water	1.00
WstA: Westola-----	88	Very limited Seepage	1.00	Very limited Piping Seepage	1.00 0.50	Very limited Depth to water	1.00
YmrA: Yomont-----	100	Very limited Seepage	1.00	Very limited Piping	1.00	Very limited Depth to water	1.00
YmtA: Yomont-----	94	Very limited Seepage	1.00	Very limited Piping	1.00	Very limited Depth to water	1.00

## Agricultural Waste Management

Soil properties are important considerations in areas where soils are used as sites for the treatment and disposal of organic waste and wastewater. Selection of soils with properties that favor waste management can help to prevent environmental damage.

Tables 16a and 16b show the degree and kind of soil limitations affecting the treatment of agricultural waste, including municipal and food-processing wastewater and effluent from lagoons or storage ponds. Municipal wastewater is the waste stream from a municipality. It contains domestic waste and may contain industrial waste. It may have received primary or secondary treatment. It is rarely untreated sewage. Food-processing wastewater results from the preparation of fruits, vegetables, milk, cheese, and meats for public consumption. In places it is high in content of sodium and chloride. In the context of these tables, the effluent in lagoons and storage ponds is from facilities used to treat or store food-processing wastewater or domestic or animal waste. Domestic and food-processing wastewater is very dilute, and the effluent from the facilities that treat or store it commonly is very low in content of carbonaceous and nitrogenous material; the content of nitrogen commonly ranges from 10 to 30 milligrams per liter. The wastewater from animal waste treatment lagoons or storage ponds, however, has much higher concentrations of these materials, mainly because the manure has not been diluted as much as the domestic waste. The content of nitrogen in this wastewater generally ranges from 50 to 2,000 milligrams per liter. When wastewater is applied, checks should be made to ensure that nitrogen, heavy metals, and salts are not added in excessive amounts.

The ratings in the tables are for waste management systems that not only dispose of and treat organic waste or wastewater but also are beneficial to crops (application of manure and food-processing waste, application of sewage sludge, and disposal of wastewater by irrigation) and for waste management systems that are designed only for the purpose of wastewater disposal and treatment (overland flow of wastewater, rapid infiltration of wastewater, and slow rate treatment of wastewater).

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect agricultural waste management. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

*Application of manure and food-processing waste* not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. Manure is the excrement of livestock and poultry, and food-processing waste is damaged fruit and vegetables and the peelings, stems, leaves, pits, and soil particles removed in food preparation. The manure and food-processing waste are either solid, slurry, or liquid. Their nitrogen content varies. A high content of nitrogen limits the application rate. Toxic or otherwise dangerous wastes, such as those mixed with the lye used in food processing, are not considered in the ratings.

The ratings are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the waste is applied, and the method by which the waste is applied. The properties that affect absorption include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, and available water capacity. The properties that affect plant growth and microbial activity include reaction, the sodium adsorption ratio, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

*Application of sewage sludge* not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. In the context of this table, sewage sludge is the residual product of the treatment of municipal sewage. The solid component consists mainly of cell mass, primarily bacteria cells that developed during secondary treatment and have incorporated soluble organics into their own bodies. The sludge has small amounts of sand, silt, and other solid debris. The content of nitrogen varies. Some sludge has constituents that are toxic to plants or hazardous to the food chain, such as heavy metals and exotic organic compounds, and should be analyzed chemically prior to use.

The content of water in the sludge ranges from about 98 percent to less than 40 percent. The sludge is considered liquid if it is more than about 90 percent water, slurry if it is about 50 to 90 percent water, and solid if it is less than about 50 percent water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the sludge is applied, and the method by which the sludge is applied. The properties that affect absorption, plant growth, and microbial activity include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, available water capacity, reaction, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of sludge. Permanently frozen soils are unsuitable for waste treatment.

*Disposal of wastewater by irrigation* not only disposes of municipal wastewater and wastewater from food-processing plants, lagoons, and storage ponds but also can improve crop production by increasing the amount of water available to crops. The ratings in the table are based on the soil properties that affect the design, construction, management, and performance of the irrigation system. The properties that affect design and management include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, slope, and flooding. The properties that affect construction include stones, cobbles, depth to bedrock or a cemented pan, depth to a water table, and ponding. The properties that affect performance include depth to bedrock or a cemented pan, bulk density, the sodium adsorption ratio, salinity, reaction, and the cation-exchange capacity, which is used to estimate the capacity of a soil to adsorb heavy metals. Permanently frozen soils are not suitable for disposal of wastewater by irrigation.

*Overland flow of wastewater* is a process in which wastewater is applied to the upper reaches of sloped land and allowed to flow across vegetated surfaces, sometimes called terraces, to runoff-collection ditches. The length of the run generally is 150 to 300 feet. The application rate ranges from 2.5 to 16.0 inches per week. It commonly exceeds the rate needed for irrigation of cropland. The wastewater leaves solids and nutrients on the vegetated surfaces as it flows downslope in a thin film.

Most of the water reaches the collection ditch, some is lost through evapotranspiration, and a small amount may percolate to the ground water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, and the design and construction of the system. Reaction and the cation-exchange capacity affect absorption. Reaction, salinity, and the sodium adsorption ratio affect plant growth and microbial activity. Slope, permeability, depth to a water table, ponding, flooding, depth to bedrock or a cemented pan, stones, and cobbles affect design and construction. Permanently frozen soils are unsuitable for waste treatment.

*Rapid infiltration of wastewater* is a process in which wastewater applied in a level basin at a rate of 4 to 120 inches per week percolates through the soil. The wastewater may eventually reach the ground water. The application rate commonly exceeds the rate needed for irrigation of cropland. Vegetation is not a necessary part of the treatment; hence, the basins may or may not be vegetated. The thickness of the soil material needed for proper treatment of the wastewater is more than 72 inches. As a result, geologic and hydrologic investigation is needed to ensure proper design and performance and to determine the risk of ground-water pollution.

The ratings in the table are based on the soil properties that affect the risk of pollution and the design, construction, and performance of the system. Depth to a water table, ponding, flooding, and depth to bedrock or a cemented pan affect the risk of pollution and the design and construction of the system. Slope, stones, and cobbles also affect design and construction. Permeability and reaction affect performance. Permanently frozen soils are unsuitable for waste treatment.

*Slow rate treatment of wastewater* is a process in which wastewater is applied to land at a rate normally between 0.5 inch and 4.0 inches per week. The application rate commonly exceeds the rate needed for irrigation of cropland. The applied wastewater is treated as it moves through the soil. Much of the treated water may percolate to the ground water, and some enters the atmosphere through evapotranspiration. The applied water generally is not allowed to run off the surface. Waterlogging is prevented either through control of the application rate or through the use of tile drains, or both.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, and the application of waste. The properties that affect absorption include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, depth to bedrock or a cemented pan, reaction, the cation-exchange capacity, and slope. Reaction, the sodium adsorption ratio, salinity, and bulk density affect plant growth and microbial activity. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood of wind erosion or water erosion. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

Table 16a.--Agricultural Waste Management, Part I

[The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table]

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Abba: Abbie-----	100	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.31	Somewhat limited Restricted permeability	0.31
AbbB: Abbie-----	95	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.31	Somewhat limited Restricted permeability	0.31
AbbB2: Abbie-----	100	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.31	Somewhat limited Restricted permeability	0.31
AbbC: Abbie-----	95	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.31	Somewhat limited Restricted permeability Too steep for surface application	0.31 0.08
AbbC2: Abbie-----	100	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.31	Somewhat limited Restricted permeability Too steep for surface application	0.31 0.08
AbsB: Abilene-----	85	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.31	Somewhat limited Restricted permeability	0.31
Ac1A: Abbie-----	87	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.31	Somewhat limited Restricted permeability	0.31
AflB: Abbie-----	100	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01

Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AflC: Abbie-----	100	Somewhat limited Restricted permeability Filtering capacity	0.41 0.01	Somewhat limited Restricted permeability Filtering capacity	0.31 0.01	Somewhat limited Restricted permeability Too steep for surface application Filtering capacity	0.31 0.08 0.01
BdaB: Berda-----	84	Not limited		Not limited		Not limited	
BdaC: Berda-----	80	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08
BdaD: Berda-----	100	Not limited		Not limited		Somewhat limited Too steep for surface application Too steep for sprinkler application	0.92 0.02
CRVE: Cottonwood-----	37	Very limited Depth to bedrock Droughty	1.00 1.00	Very limited Droughty Depth to bedrock Low adsorption	1.00 1.00 1.00	Very limited Droughty Depth to bedrock Too steep for surface application Too steep for sprinkler application	1.00 1.00 1.00 0.10
Rock outcrop-----	28	Not rated		Not rated		Not rated	
Vinson-----	12	Somewhat limited Depth to bedrock	0.16	Very limited Low adsorption Depth to bedrock	1.00 0.16	Somewhat limited Depth to bedrock Too steep for surface application	0.16 0.08
DAM: Dam-----	100	Not rated		Not rated		Not rated	
DevE: Devol-----	100	Somewhat limited Slope Filtering capacity	0.16 0.01	Somewhat limited Slope Filtering capacity	0.16 0.01	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00 0.40 0.01

Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DpwB: Deepwood-----	82	Not limited		Not limited		Not limited	
DpwC: Deepwood-----	79	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08
DpwD: Deepwood-----	90	Not limited		Not limited		Somewhat limited Too steep for surface application Too steep for sprinkler application	0.92 0.02
DpwE: Deepwood-----	89	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Too steep for surface application Too steep for sprinkler application	1.00 0.40
DvlB: Devol-----	83	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01
DvlC: Devol-----	93	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Too steep for surface application Filtering capacity	0.08 0.01
DvlD: Devol-----	90	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Too steep for surface application Too steep for sprinkler application Filtering capacity	0.92 0.02 0.01
EdlC: Eda-----	86	Very limited Filtering capacity Leaching limitation Droughty	1.00 0.45 0.01	Very limited Filtering capacity Droughty	1.00 0.01	Very limited Filtering capacity Droughty	1.00 0.01



Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EdlE: Eda-----	75	Very limited Filtering capacity Leaching limitation Slope	1.00 0.45 0.04	Very limited Filtering capacity Slope	1.00 0.04	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application	1.00 1.00 0.22
FayB: Farry-----	93	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01
FayC: Farry-----	100	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Too steep for surface application Filtering capacity	0.08 0.01
FoFE: Fortyone-----	70	Very limited Filtering capacity Slope	1.00 0.04	Very limited Filtering capacity Slope	1.00 0.04	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application	1.00 1.00 0.22
Farry-----	30	Somewhat limited Slope Filtering capacity	0.04 0.01	Somewhat limited Slope Filtering capacity	0.04 0.01	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00 0.22 0.01
FrkA: Frankirk-----	77	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.31	Somewhat limited Restricted permeability	0.31
FrkB: Frankirk-----	85	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.31	Somewhat limited Restricted permeability	0.31
FtnB: Fortyone-----	90	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00

Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FtnC: Fortyone-----	100	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00	Very limited Filtering capacity Too steep for surface application	1.00 0.08
FtnD: Fortyone-----	90	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application	1.00 0.92 0.02
GcsA: Gracemore-----	85	Very limited Depth to saturated zone Filtering capacity	1.00 0.01	Very limited Depth to saturated zone Flooding Filtering capacity	1.00 0.40 0.01	Very limited Depth to saturated zone Filtering capacity	1.00 0.01
GdfB: Grandfield-----	94	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01
GdfC: Grandfield-----	92	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Too steep for surface application Filtering capacity	0.08 0.01
GDGE: Grandfield-----	48	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Too steep for surface application Filtering capacity	0.68 0.01
Devol-----	32	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00 0.10 0.01

Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GDGE: Grandmore-----	20	Somewhat limited Restricted permeability Filtering capacity	0.41 0.01	Somewhat limited Restricted permeability Filtering capacity	0.31 0.01	Somewhat limited Restricted permeability Filtering capacity	0.31 0.01
GdmB: Grandmore-----	86	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01
GfsA: Gracemore-----	100	Very limited Depth to saturated zone Flooding Salinity Droughty Sodium content	1.00 0.60 0.50 0.05 0.02	Very limited Depth to saturated zone Flooding Salinity Droughty Sodium content	1.00 1.00 1.00 0.05 0.02	Very limited Depth to saturated zone Salinity Flooding Droughty Sodium content	1.00 1.00 0.60 0.05 0.02
GmrA: Gracemont-----	91	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone	1.00
GmsA: Gracemont-----	100	Very limited Depth to saturated zone Salinity Sodium content	1.00 0.50 0.02	Very limited Depth to saturated zone Salinity Flooding Sodium content	1.00 1.00 0.40 0.02	Very limited Depth to saturated zone Salinity Sodium content	1.00 1.00 0.02
GrmA: Gracemore-----	95	Very limited Depth to saturated zone Salinity Sodium content Filtering capacity	1.00 0.50 0.02 0.01	Very limited Depth to saturated zone Salinity Flooding Sodium content Filtering capacity	1.00 1.00 0.40 0.02 0.01	Very limited Depth to saturated zone Salinity Sodium content Filtering capacity	1.00 1.00 0.02 0.01
HdGB: Hardeman-----	60	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01
Grandmore-----	40	Somewhat limited Restricted permeability Filtering capacity	0.41 0.01	Somewhat limited Restricted permeability Filtering capacity	0.31 0.01	Somewhat limited Restricted permeability Filtering capacity	0.31 0.01

Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HdGC: Hardeman-----	70	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Too steep for surface application Filtering capacity	0.08 0.01
Grandmore-----	25	Somewhat limited Restricted permeability Filtering capacity	0.41 0.01	Somewhat limited Restricted permeability Filtering capacity	0.31 0.01	Somewhat limited Restricted permeability Too steep for surface application Filtering capacity	0.31 0.08 0.01
HdmB: Hardeman-----	85	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01
HdmC: Hardeman-----	90	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Too steep for surface application Filtering capacity	0.08 0.01
IreA: Irene-----	97	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.31	Somewhat limited Restricted permeability	0.31
IreB: Irene-----	100	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.31	Somewhat limited Restricted permeability	0.31
IreC: Irene-----	100	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.31	Somewhat limited Restricted permeability Too steep for surface application	0.31 0.08
IreD: Irene-----	100	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.31	Somewhat limited Too steep for surface application Restricted permeability Too steep for sprinkler application	0.82 0.31 0.01

Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
JssF: Jester-----	100	Very limited Filtering capacity Droughty Leaching limitation Slope	1.00 0.70 0.45 0.04	Very limited Filtering capacity Droughty Slope	1.00 0.70 0.04	Very limited Filtering capacity Too steep for surface application Droughty Too steep for sprinkler application	1.00 1.00 0.70 0.22
JstC: Jester-----	94	Very limited Filtering capacity Droughty Leaching limitation	1.00 0.60 0.45	Very limited Filtering capacity Droughty	1.00 0.60	Very limited Filtering capacity Droughty	1.00 0.60
KidB: Kingsdown-----	100	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01
KiHE: Kingsdown-----	60	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Too steep for surface application Filtering capacity	0.68 0.01
Hardeman-----	35	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00 0.10 0.01
LgtA: Lugert-----	100	Somewhat limited Flooding	0.60	Very limited Flooding	1.00	Somewhat limited Flooding	0.60
LiJC: Lincoln-----	51	Very limited Filtering capacity Leaching limitation Droughty	1.00 0.45 0.24	Very limited Filtering capacity Flooding Droughty	1.00 0.40 0.24	Very limited Filtering capacity Droughty	1.00 0.24

Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LiJC: Jester-----	49	Very limited Filtering capacity Droughty Leaching limitation	1.00 0.62 0.45	Very limited Filtering capacity Droughty Flooding	1.00 0.62 0.40	Very limited Filtering capacity Droughty	1.00 0.62
LikB: Likes-----	100	Very limited Filtering capacity Droughty Leaching limitation	1.00 0.72 0.45	Very limited Filtering capacity Droughty	1.00 0.72	Very limited Filtering capacity Droughty	1.00 0.72
LisA: Lincoln-----	100	Very limited Filtering capacity Flooding Droughty Leaching limitation	1.00 1.00 0.58 0.45	Very limited Filtering capacity Flooding Droughty	1.00 1.00 0.58	Very limited Filtering capacity Flooding Droughty	1.00 1.00 0.58
LncA: Lincoln-----	100	Very limited Filtering capacity Leaching limitation Restricted permeability Droughty	1.00 0.45 0.41 0.18	Very limited Filtering capacity Flooding Restricted permeability Droughty	1.00 0.40 0.31 0.18	Very limited Filtering capacity Restricted permeability Droughty	1.00 0.31 0.18
LROE: Laverne-----	70	Very limited Depth to cemented pan Droughty Runoff limitation	1.00 1.00 0.40	Very limited Droughty Depth to cemented pan Low adsorption	1.00 1.00 1.00	Very limited Droughty Depth to cemented pan Too steep for surface application Too steep for sprinkler application	1.00 1.00 1.00 0.10
Rock outcrop-----	20	Not rated		Not rated		Not rated	
LshA: Lesho-----	83	Very limited Filtering capacity Depth to saturated zone Restricted permeability	1.00 0.43 0.41	Very limited Filtering capacity Depth to saturated zone Flooding Restricted permeability	1.00 0.43 0.40 0.31	Very limited Filtering capacity Depth to saturated zone Restricted permeability	1.00 0.43 0.31

Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LsoA: Lincoln-----	83	Very limited Filtering capacity Flooding Leaching limitation Droughty	1.00 0.60 0.45 0.41	Very limited Filtering capacity Flooding Droughty	1.00 1.00 0.41	Very limited Filtering capacity Flooding Droughty	1.00 0.60 0.41
M-W: Water-----	100	Not rated		Not rated		Not rated	
MLBB: Mobeetie-----	45	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01
Likes-----	22	Very limited Filtering capacity Droughty Leaching limitation	1.00 0.73 0.45	Very limited Filtering capacity Droughty	1.00 0.73	Very limited Filtering capacity Droughty	1.00 0.73
Berda-----	21	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01
MLBC: Mobeetie-----	45	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Too steep for surface application Filtering capacity	0.08 0.01
Likes-----	22	Very limited Filtering capacity Droughty Leaching limitation	1.00 0.72 0.45	Very limited Filtering capacity Droughty	1.00 0.72	Very limited Filtering capacity Droughty Too steep for surface application	1.00 0.72 0.08
Berda-----	21	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Too steep for surface application Filtering capacity	0.08 0.01

Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MLBE: Mobeetie-----	45	Somewhat limited Slope Filtering capacity	0.04 0.01	Somewhat limited Slope Filtering capacity	0.04 0.01	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00 0.22 0.01
Likes-----	22	Very limited Filtering capacity Droughty Leaching limitation Slope	1.00 0.72 0.45 0.04	Very limited Filtering capacity Droughty Slope	1.00 0.72 0.04	Very limited Filtering capacity Too steep for surface application Droughty Too steep for sprinkler application	1.00 1.00 0.72 0.22
Berda-----	21	Somewhat limited Slope Filtering capacity	0.04 0.01	Somewhat limited Slope Filtering capacity	0.04 0.01	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00 0.22 0.01
MnsB: Mansic-----	94	Not limited		Not limited		Not limited	
MnsC: Mansic-----	100	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08
MsnB: Manson-----	95	Not limited		Not limited		Not limited	
MsnC: Manson-----	100	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08
MsnC2: Manson-----	95	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08



Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
OMBE: Oklark-----	43	Somewhat limited Slope Filtering capacity	0.04 0.01	Somewhat limited Slope Filtering capacity	0.04 0.01	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00  0.22  0.01
Mansic-----	27	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Too steep for surface application Too steep for sprinkler application	1.00  0.22
Berda-----	23	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Too steep for surface application Too steep for sprinkler application	1.00  0.22
OMBG: Oklark-----	33	Very limited Slope Filtering capacity	1.00 0.01	Very limited Slope Filtering capacity	1.00 0.01	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00  1.00  0.01
Mansic-----	26	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Too steep for surface application Too steep for sprinkler application	1.00  1.00
Berda-----	25	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Too steep for surface application Too steep for sprinkler application	1.00  1.00
PdoA: Paloduro-----	100	Not limited		Not limited		Not limited	
PdoB: Paloduro-----	100	Not limited		Not limited		Not limited	

Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PdoC2: Paloduro-----	90	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08
PIT: Pits-----	100	Not rated		Not rated		Not rated	
PlmB: Plemons-----	100	Not limited		Not limited		Not limited	
PlmC: Plemons-----	100	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08
PlmD: Plemons-----	90	Not limited		Not limited		Somewhat limited Too steep for surface application Too steep for sprinkler application	0.92 0.02
QnWC3: Quinlan-----	67	Very limited Depth to bedrock Droughty Depth to dense layer	1.00 1.00 1.00	Very limited Droughty Depth to bedrock Low adsorption	1.00 1.00 1.00	Very limited Droughty Depth to bedrock Too steep for surface application	1.00 1.00 0.08
Woodward-----	33	Somewhat limited Depth to bedrock Droughty	0.46 0.01	Very limited Low adsorption Depth to bedrock Droughty	1.00 0.46 0.01	Somewhat limited Depth to bedrock Too steep for surface application Droughty	0.46 0.08 0.01
QnWD: Quinlan-----	48	Very limited Depth to bedrock Depth to dense layer Droughty	1.00 1.00 1.00	Very limited Depth to bedrock Low adsorption Droughty	1.00 1.00 1.00	Very limited Depth to bedrock Droughty Too steep for surface application Too steep for sprinkler application	1.00 1.00 0.92 0.02

Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
QnWD: Woodward-----	30	Somewhat limited Depth to bedrock Droughty	0.84 0.25	Very limited Low adsorption Depth to bedrock Droughty	1.00 0.84 0.25	Somewhat limited Too steep for surface application Depth to bedrock Droughty Too steep for sprinkler application	0.92 0.84 0.25 0.02
QnWE: Quinlan-----	72	Very limited Depth to bedrock Depth to dense layer Droughty Slope	1.00 1.00 1.00 0.04	Very limited Depth to bedrock Low adsorption Droughty Slope	1.00 1.00 1.00 0.04	Very limited Depth to bedrock Too steep for surface application Droughty Too steep for sprinkler application	1.00 1.00 1.00 0.22
Woodward-----	24	Very limited Depth to dense layer Depth to bedrock Droughty Slope	1.00 0.97 0.63 0.04	Very limited Low adsorption Depth to bedrock Droughty Slope	1.00 0.97 0.63 0.04	Very limited Too steep for surface application Depth to bedrock Droughty Too steep for sprinkler application	1.00 0.97 0.63 0.22
QRWG: Quinlan-----	50	Very limited Depth to bedrock Depth to dense layer Droughty Slope	1.00 1.00 1.00 1.00	Very limited Depth to bedrock Low adsorption Droughty Slope	1.00 1.00 1.00 1.00	Very limited Depth to bedrock Droughty Too steep for surface application Too steep for sprinkler application	1.00 1.00 1.00 1.00
Rock outcrop-----	33	Not rated		Not rated		Not rated	
Woodward-----	17	Very limited Depth to dense layer Depth to bedrock Slope Droughty	1.00 0.97 0.84 0.62	Very limited Low adsorption Depth to bedrock Slope Droughty	1.00 0.97 0.84 0.62	Very limited Too steep for surface application Depth to bedrock Too steep for sprinkler application Droughty	1.00 0.97 0.90 0.62

Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
QRYG: Quinlan-----	41	Very limited Depth to bedrock Depth to dense layer Droughty Slope	1.00 1.00 1.00 1.00	Very limited Depth to bedrock Low adsorption Droughty Slope	1.00 1.00 1.00 1.00	Very limited Depth to bedrock Droughty Too steep for surface application Too steep for sprinkler application	1.00 1.00 1.00 1.00
Rock outcrop-----	18	Not rated		Not rated		Not rated	
Yomont-----	17	Very limited Flooding Filtering capacity	1.00 0.01	Very limited Flooding Filtering capacity	1.00 0.01	Very limited Flooding Filtering capacity	1.00 0.01
QWDE: Quinlan-----	41	Very limited Depth to bedrock Depth to dense layer Droughty Slope	1.00 1.00 1.00 0.04	Very limited Depth to bedrock Low adsorption Droughty Slope	1.00 1.00 1.00 0.04	Very limited Depth to bedrock Droughty Too steep for surface application Too steep for sprinkler application	1.00 1.00 1.00 0.22
Woodward-----	38	Somewhat limited Depth to bedrock Droughty Slope	0.84 0.40 0.04	Very limited Low adsorption Depth to bedrock Droughty Slope	1.00 0.84 0.40 0.04	Very limited Too steep for surface application Depth to bedrock Droughty Too steep for sprinkler application	1.00 0.84 0.40 0.22
Deepwood-----	12	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Too steep for surface application Too steep for sprinkler application	1.00 0.22
QWRC: Quinlan-----	58	Very limited Depth to bedrock Depth to dense layer Droughty	1.00 1.00 1.00	Very limited Depth to bedrock Low adsorption Droughty	1.00 1.00 1.00	Very limited Depth to bedrock Droughty	1.00 1.00
Woodward-----	23	Somewhat limited Depth to bedrock	0.01	Very limited Low adsorption Depth to bedrock	1.00 0.01	Somewhat limited Depth to bedrock	0.01
Rock outcrop-----	10	Not rated		Not rated		Not rated	

Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RoCH: Rock outcrop-----	55	Not rated		Not rated		Not rated	
Cottonwood-----	30	Very limited Depth to bedrock Droughty Slope	1.00 1.00 1.00	Very limited Droughty Depth to bedrock Low adsorption Slope	1.00 1.00 1.00 1.00	Very limited Droughty Depth to bedrock Too steep for surface application Too steep for sprinkler application	1.00 1.00 1.00 1.00
RssA: Rosston-----	100	Very limited Restricted permeability Depth to saturated zone Ponding Runoff limitation	1.00 1.00 1.00 0.40	Very limited Restricted permeability Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Restricted permeability Depth to saturated zone Ponding	1.00 1.00 1.00
SAL: Salt flats-----	100	Not rated		Not rated		Not rated	
SelA: Selman-----	96	Not limited		Not limited		Not limited	
SelB: Selman-----	92	Not limited		Not limited		Not limited	
SelC: Selman-----	87	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08
SelC2: Selman-----	100	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08
SelD: Selman-----	94	Not limited		Not limited		Somewhat limited Too steep for surface application Too steep for sprinkler application	0.92 0.02
SelD2: Selman-----	81	Not limited		Not limited		Somewhat limited Too steep for surface application Too steep for sprinkler application	0.92 0.02

Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SprA: Spur-----	87	Not limited		Somewhat limited Flooding	0.40	Not limited	
SpsA: Spur-----	100	Somewhat limited Salinity	0.06	Somewhat limited Salinity Flooding	0.50 0.40	Somewhat limited Salinity	0.50
StpA: St. Paul-----	92	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.31	Somewhat limited Restricted permeability	0.31
StpB: St. Paul-----	93	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.31	Somewhat limited Restricted permeability	0.31
StpC: St. Paul-----	95	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.31	Somewhat limited Restricted permeability Too steep for surface application	0.31 0.08
StpD: St. Paul-----	96	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.31	Somewhat limited Too steep for surface application Restricted permeability	0.68 0.31
TeWE: Teagard-----	53	Very limited Restricted permeability Depth to bedrock Runoff limitation Droughty	1.00 0.46 0.40 0.04	Very limited Restricted permeability Low adsorption Depth to bedrock Droughty	1.00 1.00 0.46 0.04	Very limited Restricted permeability Depth to bedrock Too steep for surface application Droughty	1.00 0.46 0.32 0.04
Wellsford-----	33	Very limited Restricted permeability Depth to bedrock Droughty Depth to dense layer Runoff limitation	1.00 1.00 1.00 1.00 0.40	Very limited Droughty Restricted permeability Depth to bedrock Low adsorption Sodium content	1.00 1.00 1.00 1.00 0.08	Very limited Droughty Restricted permeability Depth to bedrock Too steep for surface application Too steep for sprinkler application	1.00 1.00 1.00 1.00 0.10

Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TexA: Texroy-----	100	Not limited		Not limited		Not limited	
TexB: Texroy-----	100	Not limited		Not limited		Not limited	
TexC: Texroy-----	100	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08
TipA: Tipton-----	95	Not limited		Not limited		Not limited	
TipB: Tipton-----	100	Not limited		Not limited		Not limited	
TipC: Tipton-----	100	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08
TipD: Tipton-----	87	Not limited		Not limited		Somewhat limited Too steep for surface application	0.68
TRQC: Talpa-----	53	Very limited Depth to bedrock Droughty Runoff limitation	1.00 1.00 0.40	Very limited Droughty Depth to bedrock Low adsorption	1.00 1.00 1.00	Very limited Droughty Depth to bedrock	1.00 1.00
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Quinlan-----	22	Very limited Depth to bedrock Depth to dense layer Droughty	1.00 1.00 1.00	Very limited Depth to bedrock Low adsorption Droughty	1.00 1.00 1.00	Very limited Depth to bedrock Droughty	1.00 1.00
Tv1C: Tivoli-----	85	Very limited Filtering capacity Droughty Leaching limitation	1.00 0.60 0.45	Very limited Filtering capacity Droughty	1.00 0.60	Very limited Filtering capacity Droughty	1.00 0.60

Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TvlE: Tivoli-----	88	Very limited Filtering capacity Leaching limitation Droughty Slope	1.00 0.45 0.44 0.04	Very limited Filtering capacity Droughty Slope	1.00 0.44 0.04	Very limited Filtering capacity Too steep for surface application Droughty Too steep for sprinkler application	1.00 1.00 0.44 0.22
TvlG: Tivoli-----	97	Very limited Filtering capacity Slope Droughty Leaching limitation	1.00 1.00 0.58 0.45	Very limited Filtering capacity Slope Droughty	1.00 1.00 0.58	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application Droughty	1.00 1.00 1.00 0.58
VerB: Vernon-----	75	Very limited Restricted permeability Sodium content Droughty Runoff limitation Depth to bedrock	1.00 0.68 0.45 0.40 0.16	Very limited Restricted permeability Low adsorption Sodium content Droughty Depth to bedrock	1.00 1.00 0.68 0.45 0.16	Very limited Restricted permeability Sodium content Droughty Depth to bedrock	1.00 0.68 0.45 0.16
VerC: Vernon-----	69	Very limited Restricted permeability Sodium content Runoff limitation Droughty Depth to bedrock	1.00 0.68 0.40 0.35 0.10	Very limited Restricted permeability Low adsorption Sodium content Droughty Depth to bedrock	1.00 1.00 0.68 0.35 0.10	Very limited Restricted permeability Sodium content Droughty Depth to bedrock Too steep for surface application	1.00 0.68 0.35 0.10 0.08
VerD: Vernon-----	80	Very limited Restricted permeability Droughty Depth to bedrock Sodium content Runoff limitation	1.00 0.94 0.80 0.68 0.40	Very limited Restricted permeability Low adsorption Droughty Depth to bedrock Sodium content	1.00 1.00 0.94 0.80 0.68	Very limited Restricted permeability Droughty Too steep for surface application Depth to bedrock Sodium content	1.00 0.94 0.92 0.80 0.68



Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
VrrB: Vernon-----	86	Very limited Restricted permeability Runoff limitation Droughty Depth to bedrock Filtering capacity	1.00 0.40 0.11 0.01 0.01	Very limited Restricted permeability Low adsorption Droughty Depth to bedrock Filtering capacity	1.00 1.00 0.11 0.01 0.01	Very limited Restricted permeability Droughty Depth to bedrock Filtering capacity	1.00 0.11 0.01 0.01
VrrC: Vernon-----	76	Very limited Restricted permeability Runoff limitation Droughty Depth to bedrock Filtering capacity	1.00 0.40 0.15 0.03 0.01	Very limited Restricted permeability Low adsorption Droughty Depth to bedrock Filtering capacity	1.00 1.00 0.15 0.03 0.01	Very limited Restricted permeability Droughty Too steep for surface application Depth to bedrock Filtering capacity	1.00 0.15 0.08 0.03 0.01
W: Water-----	100	Not rated		Not rated		Not rated	
WodA: Woods-----	80	Very limited Restricted permeability Runoff limitation	1.00 0.40	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
WodB: Woods-----	86	Very limited Restricted permeability Runoff limitation	1.00 0.40	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
WodC: Woods-----	100	Very limited Restricted permeability Runoff limitation	1.00 0.40	Very limited Restricted permeability	1.00	Very limited Restricted permeability Too steep for surface application	1.00 0.08
WQHE: Westola-----	48	Somewhat limited Flooding Filtering capacity	0.60 0.01	Very limited Flooding Filtering capacity	1.00 0.01	Somewhat limited Flooding Filtering capacity	0.60 0.01

Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WQHE: Quinlan-----	30	Very limited Depth to bedrock 1.00 Depth to dense layer 1.00 Droughty 1.00		Very limited Depth to bedrock 1.00 Low adsorption 1.00 Droughty 1.00		Very limited Depth to bedrock 1.00 Droughty 1.00 Too steep for surface application 0.92 Too steep for sprinkler application 0.02	
Hardeman-----	22	Somewhat limited Filtering capacity 0.01		Somewhat limited Filtering capacity 0.01		Somewhat limited Too steep for surface application 0.92 Too steep for sprinkler application 0.02 Filtering capacity 0.01	
WQnB: Woodward-----	45	Somewhat limited Depth to bedrock 0.84 Droughty 0.25		Very limited Low adsorption 1.00 Depth to bedrock 0.84 Droughty 0.25		Somewhat limited Depth to bedrock 0.84 Droughty 0.25	
Quinlan-----	43	Very limited Depth to bedrock 1.00 Depth to dense layer 1.00 Droughty 1.00		Very limited Depth to bedrock 1.00 Low adsorption 1.00 Droughty 1.00		Very limited Depth to bedrock 1.00 Droughty 1.00	
WQnC: Woodward-----	56	Somewhat limited Depth to bedrock 0.46 Droughty 0.01		Very limited Low adsorption 1.00 Depth to bedrock 0.46 Droughty 0.01		Somewhat limited Depth to bedrock 0.46 Too steep for surface application 0.08 Droughty 0.01	
Quinlan-----	22	Very limited Depth to bedrock 1.00 Depth to dense layer 1.00 Droughty 1.00		Very limited Depth to bedrock 1.00 Low adsorption 1.00 Droughty 1.00		Very limited Depth to bedrock 1.00 Droughty 1.00 Too steep for surface application 0.08	
WslA: Westola-----	75	Somewhat limited Flooding 0.60 Filtering capacity 0.01		Very limited Flooding 1.00 Filtering capacity 0.01		Somewhat limited Flooding 0.60 Filtering capacity 0.01	
WstA: Westola-----	88	Somewhat limited Filtering capacity 0.01		Somewhat limited Flooding 0.40 Filtering capacity 0.01		Somewhat limited Filtering capacity 0.01	

Table 16a.--Agricultural Waste Management, Part I--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
YmrA: Yomont-----	100	Somewhat limited Filtering capacity	0.01	Somewhat limited Flooding Filtering capacity	0.40 0.01	Somewhat limited Filtering capacity	0.01
YmtA: Yomont-----	94	Somewhat limited Flooding Filtering capacity	0.60 0.01	Very limited Flooding Filtering capacity	1.00 0.01	Somewhat limited Flooding Filtering capacity	0.60 0.01

Table 16b.--Agricultural Waste Management, Part II

[The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table]

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AbbA: Abbie-----	100	Very limited Seepage Too level	1.00 0.50	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability	0.21
AbbB: Abbie-----	95	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability	0.21
AbbB2: Abbie-----	100	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability	0.21
AbbC: Abbie-----	95	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability Too steep for surface application	0.21 0.08
AbbC2: Abbie-----	100	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability Too steep for surface application	0.21 0.08
AbsB: Abilene-----	85	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability	0.21
AclA: Abbie-----	87	Very limited Seepage Too level	1.00 0.50	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability	0.21
AflB: Abbie-----	100	Very limited Seepage	1.00	Somewhat limited Restricted permeability	0.61	Somewhat limited Filtering capacity	0.01

Table 16b.--Agricultural Waste Management, Part II--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Af1C: Abbie-----	100	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability Too steep for surface application Filtering capacity	0.21 0.08 0.01
BdaB: Berda-----	84	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Not limited	
BdaC: Berda-----	80	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Too steep for surface application	0.08
BdaD: Berda-----	100	Very limited Seepage Too steep for surface application	1.00 0.06	Very limited Restricted permeability Slope	1.00 0.88	Somewhat limited Too steep for surface application Too steep for sprinkler application	0.92 0.06
CRVE: Cottonwood-----	37	Very limited Seepage Depth to bedrock Too steep for surface application	1.00 1.00 0.22	Very limited Depth to bedrock Restricted permeability Slope	1.00 1.00 1.00	Very limited Depth to bedrock Too steep for surface application Too steep for sprinkler application	1.00 1.00 0.22
Rock outcrop-----	28	Not rated		Not rated		Not rated	
Vinson-----	12	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability	1.00 1.00	Very limited Depth to bedrock Too steep for surface application	1.00 0.08
DAM: Dam-----	100	Not rated		Not rated		Not rated	
DevE: Devol-----	100	Very limited Seepage Too steep for surface application	1.00 0.78	Very limited Slope Restricted permeability	1.00 0.31	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00 0.78 0.01

Table 16b.--Agricultural Waste Management, Part II--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DpwB: Deepwood-----	82	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Not limited	
DpwC: Deepwood-----	79	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Too steep for surface application	0.08
DpwD: Deepwood-----	90	Very limited Seepage Too steep for surface application	1.00 0.06	Very limited Restricted permeability Slope	1.00 0.88	Somewhat limited Too steep for surface application Too steep for sprinkler application	0.92 0.06
DpwE: Deepwood-----	89	Very limited Seepage Too steep for surface application	1.00 0.78	Very limited Slope Restricted permeability	1.00 1.00	Very limited Too steep for surface application Too steep for sprinkler application	1.00 0.78
DvlB: Devol-----	83	Very limited Seepage	1.00	Somewhat limited Restricted permeability	0.31	Somewhat limited Filtering capacity	0.01
DvlC: Devol-----	93	Very limited Seepage	1.00	Somewhat limited Restricted permeability	0.31	Somewhat limited Too steep for surface application Filtering capacity	0.08 0.01
DvlD: Devol-----	90	Very limited Seepage Too steep for surface application	1.00 0.06	Somewhat limited Slope Restricted permeability	0.88 0.31	Somewhat limited Too steep for surface application Too steep for sprinkler application Filtering capacity	0.92 0.06 0.01
EdlC: Eda-----	86	Very limited Seepage	1.00	Not limited		Very limited Filtering capacity	1.00

Table 16b.--Agricultural Waste Management, Part II--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EdlE: Eda-----	75	Very limited Seepage Too steep for surface application	1.00 0.50	Very limited Slope	1.00	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application	1.00 1.00 0.50
FayB: Farry-----	93	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Filtering capacity	0.01
FayC: Farry-----	100	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Too steep for surface application Filtering capacity	0.08 0.01
FoFE: Fortyone-----	70	Very limited Seepage Too steep for surface application	1.00 0.50	Very limited Slope Restricted permeability	1.00 0.31	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application	1.00 1.00 0.50
Farry-----	30	Very limited Seepage Too steep for surface application	1.00 0.50	Very limited Restricted permeability Slope	1.00 1.00	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00 0.50 0.01
FrkA: Frankirk-----	77	Very limited Seepage Too level	1.00 0.50	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability	0.21
FrkB: Frankirk-----	85	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability	0.21
FtnB: Fortyone-----	90	Very limited Seepage	1.00	Somewhat limited Restricted permeability	0.31	Very limited Filtering capacity	1.00

Table 16b.--Agricultural Waste Management, Part II--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FtnC: Fortyone-----	100	Very limited Seepage	1.00	Somewhat limited Restricted permeability	0.31	Very limited Filtering capacity Too steep for surface application	1.00 0.08
FtnD: Fortyone-----	90	Very limited Seepage Too steep for surface application	1.00 0.06	Somewhat limited Slope Restricted permeability	0.88 0.31	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application	1.00 0.92 0.06
GcsA: Gracemore-----	85	Very limited Seepage Depth to saturated zone Too level Flooding	1.00 1.00 0.50 0.40	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Filtering capacity	1.00 0.01
GdfB: Grandfield-----	94	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Filtering capacity	0.01
GdfC: Grandfield-----	92	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Too steep for surface application Filtering capacity	0.08 0.01
GDGE: Grandfield-----	48	Very limited Seepage	1.00	Very limited Restricted permeability Slope	1.00 0.50	Somewhat limited Too steep for surface application Filtering capacity	0.68 0.01
Devol-----	32	Very limited Seepage Too steep for surface application	1.00 0.22	Very limited Slope Restricted permeability	1.00 0.31	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00 0.22 0.01



Table 16b.--Agricultural Waste Management, Part II--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GDGE: Grandmore-----	20	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability Filtering capacity	0.21 0.01
GdmB: Grandmore-----	86	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Filtering capacity	0.01
GfsA: Gracemore-----	100	Very limited Flooding Seepage Depth to saturated zone Too level Salinity	1.00 1.00 1.00 0.50 0.13	Very limited Depth to saturated zone Flooding Restricted permeability	1.00 0.60 0.31	Very limited Depth to saturated zone Salinity Flooding Sodium content Filtering capacity	1.00 1.00 0.60 0.02 0.01
GmrA: Gracemont-----	91	Very limited Seepage Depth to saturated zone Too level Flooding	1.00 1.00 0.50 0.40	Very limited Depth to saturated zone Restricted permeability	1.00 0.61	Very limited Depth to saturated zone	1.00
GmsA: Gracemont-----	100	Very limited Seepage Depth to saturated zone Too level Flooding Salinity	1.00 1.00 0.50 0.40 0.13	Very limited Depth to saturated zone Restricted permeability	1.00 0.61	Very limited Depth to saturated zone Salinity Sodium content	1.00 1.00 0.02
GrmA: Gracemore-----	95	Very limited Seepage Depth to saturated zone Too level Flooding Salinity	1.00 1.00 0.50 0.40 0.13	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Salinity Sodium content Filtering capacity	1.00 1.00 0.02 0.01
HdGB: Hardeman-----	60	Very limited Seepage	1.00	Somewhat limited Restricted permeability	0.31	Somewhat limited Filtering capacity	0.01
Grandmore-----	40	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability Filtering capacity	0.21 0.01

Table 16b.--Agricultural Waste Management, Part II--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HdGC: Hardeman-----	70	Very limited Seepage	1.00	Somewhat limited Restricted permeability	0.31	Somewhat limited Too steep for surface application Filtering capacity	0.08 0.01
Grandmore-----	25	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability Too steep for surface application Filtering capacity	0.21 0.08 0.01
HdmB: Hardeman-----	85	Very limited Seepage	1.00	Somewhat limited Restricted permeability	0.31	Somewhat limited Filtering capacity	0.01
HdmC: Hardeman-----	90	Very limited Seepage	1.00	Somewhat limited Restricted permeability	0.31	Somewhat limited Too steep for surface application Filtering capacity	0.08 0.01
IreA: Irene-----	97	Very limited Seepage Too level	1.00 0.50	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability	0.21
IreB: Irene-----	100	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability	0.21
IreC: Irene-----	100	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability Too steep for surface application	0.21 0.08
IreD: Irene-----	100	Very limited Seepage Too steep for surface application	1.00 0.01	Very limited Restricted permeability Slope	1.00 0.72	Somewhat limited Too steep for surface application Restricted permeability Too steep for sprinkler application	0.82 0.21 0.01

Table 16b.--Agricultural Waste Management, Part II--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
JssF: Jester-----	100	Very limited Seepage Too steep for surface application	1.00 0.50	Very limited Slope	1.00	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application	1.00 1.00 0.50
JstC: Jester-----	94	Very limited Seepage	1.00	Not limited		Very limited Filtering capacity	1.00
KidB: Kingsdown-----	100	Very limited Seepage	1.00	Somewhat limited Restricted permeability	0.31	Somewhat limited Filtering capacity	0.01
KiHE: Kingsdown-----	60	Very limited Seepage	1.00	Somewhat limited Slope Restricted permeability	0.50 0.31	Somewhat limited Too steep for surface application Filtering capacity	0.68 0.01
Hardeman-----	35	Very limited Seepage Too steep for surface application	1.00 0.22	Very limited Slope Restricted permeability	1.00 0.31	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00 0.22 0.01
LgtA: Lugert-----	100	Very limited Flooding Seepage Too level	1.00 1.00 0.50	Very limited Restricted permeability Flooding	1.00 0.60	Somewhat limited Flooding	0.60
LiJC: Lincoln-----	51	Very limited Seepage Too level Flooding	1.00 0.50 0.40	Not limited		Very limited Filtering capacity	1.00
Jester-----	49	Very limited Seepage Flooding	1.00 0.40	Not limited		Very limited Filtering capacity	1.00
LikB: Likes-----	100	Very limited Seepage	1.00	Not limited		Very limited Filtering capacity	1.00

Table 16b.--Agricultural Waste Management, Part II--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LisA: Lincoln-----	100	Very limited Flooding Seepage Too level	1.00 1.00 0.50	Very limited Flooding	1.00	Very limited Filtering capacity Flooding	1.00 1.00
LncA: Lincoln-----	100	Somewhat limited Seepage Too level Flooding	0.69 0.50 0.40	Very limited Restricted permeability	1.00	Very limited Filtering capacity Restricted permeability	1.00 0.21
LROE: Laverne-----	70	Very limited Seepage Depth to cemented pan Too steep for surface application	1.00 1.00 0.22	Very limited Depth to cemented pan Restricted permeability Slope	1.00 1.00 1.00	Very limited Depth to cemented pan Too steep for surface application Too steep for sprinkler application	1.00 1.00 0.22
Rock outcrop-----	20	Not rated		Not rated		Not rated	
LshA: Lesho-----	83	Somewhat limited Seepage Too level Depth to saturated zone Flooding	0.69 0.50 0.43 0.40	Very limited Restricted permeability Depth to saturated zone	1.00 1.00	Very limited Filtering capacity Depth to saturated zone Restricted permeability	1.00 0.43 0.21
LsoA: Lincoln-----	83	Very limited Flooding Seepage Too level	1.00 1.00 0.50	Somewhat limited Flooding	0.60	Very limited Filtering capacity Flooding	1.00 0.60
M-W: Water-----	100	Not rated		Not rated		Not rated	
MLBB: Mobeetie-----	45	Very limited Seepage	1.00	Somewhat limited Restricted permeability	0.31	Somewhat limited Filtering capacity	0.01
Likes-----	22	Very limited Seepage	1.00	Not limited		Very limited Filtering capacity	1.00
Berda-----	21	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Filtering capacity	0.01

Table 16b.--Agricultural Waste Management, Part II--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MLBC: Mobeetie-----	45	Very limited Seepage	1.00	Somewhat limited Restricted permeability	0.31	Somewhat limited Too steep for surface application Filtering capacity	0.08 0.01
Likes-----	22	Very limited Seepage	1.00	Not limited		Very limited Filtering capacity Too steep for surface application	1.00 0.08
Berda-----	21	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Too steep for surface application Filtering capacity	0.08 0.01
MLBE: Mobeetie-----	45	Very limited Seepage Too steep for surface application	1.00 0.50	Very limited Slope Restricted permeability	1.00 0.31	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00 0.50 0.01
Likes-----	22	Very limited Seepage Too steep for surface application	1.00 0.50	Very limited Slope	1.00	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application	1.00 1.00 0.50
Berda-----	21	Very limited Seepage Too steep for surface application	1.00 0.50	Very limited Restricted permeability Slope	1.00 1.00	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00 0.50 0.01
MnsB: Mansic-----	94	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Not limited	

Table 16b.--Agricultural Waste Management, Part II--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MnsC: Mansic-----	100	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Too steep for surface application	0.08
MsnB: Manson-----	95	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Not limited	
MsnC: Manson-----	100	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Too steep for surface application	0.08
MsnC2: Manson-----	95	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Too steep for surface application	0.08
OMBE: Oklark-----	43	Very limited Seepage Too steep for surface application	1.00 0.50	Very limited Restricted permeability Slope	1.00 1.00	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00 0.50 0.01
Mansic-----	27	Very limited Seepage Too steep for surface application	1.00 0.50	Very limited Restricted permeability Slope	1.00 1.00	Very limited Too steep for surface application Too steep for sprinkler application	1.00 0.50
Berda-----	23	Very limited Seepage Too steep for surface application	1.00 0.50	Very limited Restricted permeability Slope	1.00 1.00	Very limited Too steep for surface application Too steep for sprinkler application	1.00 0.50
OMBG: Oklark-----	33	Very limited Seepage Too steep for surface application	1.00 1.00	Very limited Slope Restricted permeability	1.00 0.31	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00 1.00 0.01

Table 16b.--Agricultural Waste Management, Part II--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
OMBG: Mansic-----	26	Very limited Seepage Too steep for surface application	1.00 1.00	Very limited Slope Restricted permeability	1.00 1.00	Very limited Too steep for surface application Too steep for sprinkler application	1.00 1.00
Berda-----	25	Very limited Seepage Too steep for surface application	1.00 1.00	Very limited Slope Restricted permeability	1.00 1.00	Very limited Too steep for surface application Too steep for sprinkler application	1.00 1.00
PdoA: Paloduro-----	100	Very limited Seepage Too level	1.00 0.50	Very limited Restricted permeability	1.00	Not limited	
PdoB: Paloduro-----	100	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Not limited	
PdoC2: Paloduro-----	90	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Too steep for surface application	0.08
PIT: Pits-----	100	Not rated		Not rated		Not rated	
PlmB: Plemons-----	100	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Not limited	
PlmC: Plemons-----	100	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Too steep for surface application	0.08
PlmD: Plemons-----	90	Very limited Seepage Too steep for surface application	1.00 0.06	Very limited Restricted permeability Slope	1.00 0.88	Somewhat limited Too steep for surface application Too steep for sprinkler application	0.92 0.06

Table 16b.--Agricultural Waste Management, Part II--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
QnWC3: Quinlan-----	67	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability	1.00 0.61	Very limited Depth to bedrock Too steep for surface application	1.00 0.08
Woodward-----	33	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability	1.00 1.00	Very limited Depth to bedrock Too steep for surface application	1.00 0.08
QnWD: Quinlan-----	48	Very limited Seepage Depth to bedrock Too steep for surface application	1.00 1.00 0.06	Very limited Depth to bedrock Restricted permeability Slope	1.00 1.00 0.88	Very limited Depth to bedrock Too steep for surface application Too steep for sprinkler application	1.00 0.92 0.06
Woodward-----	30	Very limited Seepage Depth to bedrock Too steep for surface application	1.00 1.00 0.06	Very limited Depth to bedrock Restricted permeability Slope	1.00 1.00 0.88	Very limited Depth to bedrock Too steep for surface application Too steep for sprinkler application	1.00 0.92 0.06
QnWE: Quinlan-----	72	Very limited Seepage Depth to bedrock Too steep for surface application	1.00 1.00 0.50	Very limited Depth to bedrock Restricted permeability Slope	1.00 1.00 1.00	Very limited Depth to bedrock Too steep for surface application Too steep for sprinkler application	1.00 1.00 0.50
Woodward-----	24	Very limited Seepage Depth to bedrock Too steep for surface application	1.00 1.00 0.50	Very limited Depth to bedrock Restricted permeability Slope	1.00 1.00 1.00	Very limited Depth to bedrock Too steep for surface application Too steep for sprinkler application	1.00 1.00 0.50
QRWG: Quinlan-----	50	Very limited Seepage Depth to bedrock Too steep for surface application	1.00 1.00 1.00	Very limited Depth to bedrock Restricted permeability Slope	1.00 1.00 1.00	Very limited Depth to bedrock Too steep for surface application Too steep for sprinkler application	1.00 1.00 1.00



Table 16b.--Agricultural Waste Management, Part II--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
QRWG: Rock outcrop-----	33	Not rated		Not rated		Not rated	
Woodward-----	17	Very limited Seepage Depth to bedrock Too steep for surface application	1.00 1.00 1.00	Very limited Depth to bedrock Restricted permeability Slope	1.00 1.00 1.00	Very limited Depth to bedrock Too steep for surface application Too steep for sprinkler application	1.00 1.00 1.00
QRYG: Quinlan-----	41	Very limited Seepage Depth to bedrock Too steep for surface application	1.00 1.00 1.00	Very limited Depth to bedrock Restricted permeability Slope	1.00 1.00 1.00	Very limited Depth to bedrock Too steep for surface application Too steep for sprinkler application	1.00 1.00 1.00
Rock outcrop-----	18	Not rated		Not rated		Not rated	
Yomont-----	17	Very limited Flooding Seepage	1.00 1.00	Very limited Flooding Restricted permeability	1.00 0.31	Very limited Flooding Filtering capacity	1.00 0.01
QWDE: Quinlan-----	41	Very limited Seepage Depth to bedrock Too steep for surface application	1.00 1.00 0.50	Very limited Depth to bedrock Restricted permeability Slope	1.00 1.00 1.00	Very limited Depth to bedrock Too steep for surface application Too steep for sprinkler application	1.00 1.00 0.50
Woodward-----	38	Very limited Seepage Depth to bedrock Too steep for surface application	1.00 1.00 0.50	Very limited Depth to bedrock Restricted permeability Slope	1.00 1.00 1.00	Very limited Depth to bedrock Too steep for surface application Too steep for sprinkler application	1.00 1.00 0.50
Deepwood-----	12	Very limited Seepage Too steep for surface application	1.00 0.50	Very limited Restricted permeability Slope	1.00 1.00	Very limited Too steep for surface application Too steep for sprinkler application	1.00 0.50

Table 16b.--Agricultural Waste Management, Part II--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
QWRC: Quinlan-----	58	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability	1.00 1.00	Very limited Depth to bedrock	1.00
Woodward-----	23	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability	1.00 1.00	Very limited Depth to bedrock	1.00
Rock outcrop-----	10	Not rated		Not rated		Not rated	
RoCH: Rock outcrop-----	55	Not rated		Not rated		Not rated	
Cottonwood-----	30	Very limited Seepage Depth to bedrock Too steep for surface application	1.00 1.00 1.00	Very limited Slope Depth to bedrock Restricted permeability	1.00 1.00 1.00	Very limited Depth to bedrock Too steep for surface application Too steep for sprinkler application	1.00 1.00 1.00
RssA: Rosston-----	100	Very limited Depth to saturated zone Ponding Too level	1.00 1.00 0.50	Very limited Restricted permeability Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Restricted permeability Ponding	1.00 1.00 1.00
SAL: Salt flats-----	100	Not rated		Not rated		Not rated	
SelA: Selman-----	96	Very limited Seepage Too level	1.00 0.50	Very limited Restricted permeability	1.00	Not limited	
SelB: Selman-----	92	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Not limited	
SelC: Selman-----	87	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Too steep for surface application	0.08
SelC2: Selman-----	100	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Too steep for surface application	0.08

Table 16b.--Agricultural Waste Management, Part II--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SelD: Selman-----	94	Very limited Seepage Too steep for surface application	1.00 0.06	Very limited Restricted permeability Slope	1.00 0.88	Somewhat limited Too steep for surface application Too steep for sprinkler application	0.92 0.06
SelD2: Selman-----	81	Very limited Seepage Too steep for surface application	1.00 0.06	Very limited Restricted permeability Slope	1.00 0.88	Somewhat limited Too steep for surface application Too steep for sprinkler application	0.92 0.06
SprA: Spur-----	87	Very limited Seepage Too level Flooding	1.00 0.50 0.40	Very limited Restricted permeability	1.00	Not limited	
SpsA: Spur-----	100	Very limited Seepage Too level Flooding	1.00 0.50 0.40	Very limited Restricted permeability	1.00	Somewhat limited Salinity	0.50
StpA: St. Paul-----	92	Very limited Seepage Too level	1.00 0.50	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability	0.21
StpB: St. Paul-----	93	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability	0.21
StpC: St. Paul-----	95	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability Too steep for surface application	0.21 0.08
StpD: St. Paul-----	96	Very limited Seepage	1.00	Very limited Restricted permeability Slope	1.00 0.50	Somewhat limited Too steep for surface application Restricted permeability	0.68 0.21

Table 16b.--Agricultural Waste Management, Part II--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TeWE: Teagard-----	53	Very limited Depth to bedrock	1.00	Very limited Restricted permeability Depth to bedrock Slope	1.00 1.00 0.12	Very limited Depth to bedrock Restricted permeability Too steep for surface application	1.00 1.00 0.32
Wellsford-----	33	Very limited Depth to bedrock Too steep for surface application Sodium content	1.00 0.22 0.08	Very limited Restricted permeability Depth to bedrock Slope	1.00 1.00 1.00	Very limited Depth to bedrock Restricted permeability Too steep for surface application Too steep for sprinkler application Sodium content	1.00 1.00 1.00 0.22 0.08
TexA: Texroy-----	100	Very limited Seepage Too level	1.00 0.50	Very limited Restricted permeability	1.00	Not limited	
TexB: Texroy-----	100	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Not limited	
TexC: Texroy-----	100	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Too steep for surface application	0.08
TipA: Tipton-----	95	Very limited Seepage Too level	1.00 0.50	Very limited Restricted permeability	1.00	Not limited	
TipB: Tipton-----	100	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Not limited	
TipC: Tipton-----	100	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Too steep for surface application	0.08
TipD: Tipton-----	87	Very limited Seepage	1.00	Very limited Restricted permeability Slope	1.00 0.50	Somewhat limited Too steep for surface application	0.68

Table 16b.--Agricultural Waste Management, Part II--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TRQC: Talpa-----	53	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability	1.00 1.00	Very limited Depth to bedrock	1.00
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Quinlan-----	22	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability	1.00 1.00	Very limited Depth to bedrock	1.00
Tv1C: Tivoli-----	85	Very limited Seepage	1.00	Not limited		Very limited Filtering capacity	1.00
Tv1E: Tivoli-----	88	Very limited Seepage Too steep for surface application	1.00 0.50	Very limited Slope	1.00	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application	1.00 1.00 0.50
Tv1G: Tivoli-----	97	Very limited Seepage Too steep for surface application	1.00 1.00	Very limited Slope	1.00	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application	1.00 1.00 1.00
VerB: Vernon-----	75	Very limited Depth to bedrock Sodium content	1.00 0.68	Very limited Restricted permeability Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability Sodium content	1.00 1.00 0.68
VerC: Vernon-----	69	Very limited Depth to bedrock Sodium content	1.00 0.68	Very limited Restricted permeability Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability Sodium content Too steep for surface application	1.00 1.00 0.68 0.08

Table 16b.--Agricultural Waste Management, Part II--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
VerD: Vernon-----	80	Very limited Depth to bedrock Sodium content Too steep for surface application	1.00 0.68 0.06	Very limited Restricted permeability Depth to bedrock Slope	1.00 1.00 0.88	Very limited Depth to bedrock Restricted permeability Too steep for surface application Sodium content Too steep for sprinkler application	1.00 1.00 0.92 0.68 0.06
VrrB: Vernon-----	86	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Restricted permeability Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability Filtering capacity	1.00 1.00 0.01
VrrC: Vernon-----	76	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Restricted permeability Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability Too steep for surface application Filtering capacity	1.00 1.00 0.08 0.01
W: Water-----	100	Not rated		Not rated		Not rated	
WodA: Woods-----	80	Somewhat limited Seepage Too level	0.69 0.50	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
WodB: Woods-----	86	Somewhat limited Seepage	0.69	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
WodC: Woods-----	100	Somewhat limited Seepage	0.69	Very limited Restricted permeability	1.00	Very limited Restricted permeability Too steep for surface application	1.00 0.08
WQHE: Westola-----	48	Very limited Flooding Seepage Too level	1.00 1.00 0.50	Very limited Restricted permeability Flooding	1.00 0.60	Somewhat limited Flooding Filtering capacity	0.60 0.01

Table 16b.--Agricultural Waste Management, Part II--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WQHE: Quinlan-----	30	Very limited Seepage Depth to bedrock Too steep for surface application	1.00 1.00 0.06	Very limited Depth to bedrock Restricted permeability Slope	1.00 1.00 0.88	Very limited Depth to bedrock Too steep for surface application Too steep for sprinkler application	1.00 0.92 0.06
Hardeman-----	22	Very limited Seepage Too steep for surface application	1.00 0.06	Somewhat limited Slope Restricted permeability	0.88 0.31	Somewhat limited Too steep for surface application Too steep for sprinkler application Filtering capacity	0.92 0.06 0.01
WQnB: Woodward-----	45	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability	1.00 1.00	Very limited Depth to bedrock	1.00
Quinlan-----	43	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability	1.00 1.00	Very limited Depth to bedrock	1.00
WQnC: Woodward-----	56	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability	1.00 1.00	Very limited Depth to bedrock Too steep for surface application	1.00 0.08
Quinlan-----	22	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability	1.00 1.00	Very limited Depth to bedrock Too steep for surface application	1.00 0.08
WslA: Westola-----	75	Very limited Flooding Seepage Too level	1.00 1.00 0.50	Somewhat limited Flooding Restricted permeability	0.60 0.31	Somewhat limited Flooding Filtering capacity	0.60 0.01
WstA: Westola-----	88	Very limited Seepage Too level Flooding	1.00 0.50 0.40	Somewhat limited Restricted permeability	0.31	Somewhat limited Filtering capacity	0.01

Table 16b.--Agricultural Waste Management, Part II--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
YmrA: Yomont-----	100	Very limited Seepage Too level Flooding	1.00 0.50 0.40	Somewhat limited Restricted permeability	0.31	Somewhat limited Filtering capacity	0.01
YmtA: Yomont-----	94	Very limited Flooding Seepage Too level	1.00 1.00 0.50	Somewhat limited Flooding Restricted permeability	0.60 0.31	Somewhat limited Flooding Filtering capacity	0.60 0.01



# Soil Properties

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Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

## Engineering Index Properties

Table 17, "Engineering Index Properties," gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

*Depth* to the upper and lower boundaries of each layer is indicated.

*Texture* is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

*Classification* of the soils is determined according to the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1998) and the Unified soil classification system (ASTM, 1998).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index.

Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

*Rock fragments* larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

*Percentage (of soil particles) passing designated sieves* is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

*Liquid limit* and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

Table 17.--Engineering Index Properties

[Absence of an entry indicates that the data were not estimated]

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
AbbA: Abbie-----	0-12	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	85-100	55-85	25-35	5-13
	12-23	Loam, clay loam	CL	A-4, A-6	0	0	95-100	90-100	85-100	55-90	30-40	9-18
	23-42	Clay loam, loam, sandy clay loam	SC, CL	A-2, A-4, A-6	0	0	95-100	90-100	80-100	30-90	25-40	8-18
	42-80	Loam, sandy loam, sandy clay loam, clay loam	SM, SC, ML, CL	A-2, A-4, A-6	0	0	80-100	75-100	70-100	25-90	15-40	NP-18
AbbB: Abbie-----	0-12	Loam	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	85-100	55-85	25-35	5-13
	12-24	Clay loam, loam	CL	A-4, A-6	0	0	95-100	90-100	85-100	55-90	30-40	9-18
	24-44	Clay loam, sandy clay loam, loam	SC, CL	A-2, A-4, A-6	0	0	95-100	90-100	80-100	30-90	25-40	8-18
	44-49	Loam	ML, CL, SC, SM	A-2, A-4, A-6	0	0	80-100	75-100	70-100	25-90	15-40	NP-18
	49-91	Clay loam	SC, CL	A-2, A-4, A-6	0	0	95-100	90-100	80-100	30-90	25-40	8-18
AbbB2: Abbie-----	0-7	Loam	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	85-100	55-85	25-35	5-13
	7-17	Clay loam, loam	CL	A-4, A-6	0	0	95-100	90-100	85-100	55-90	30-40	9-18
	17-32	Clay loam, sandy clay loam, loam	SC, CL	A-2, A-4, A-6	0	0	95-100	90-100	80-100	30-90	25-40	8-18
	32-42	Clay loam, sandy loam, loam, sandy clay loam	SM, SC, ML, CL	A-2, A-4, A-6	0	0	80-100	75-100	70-100	25-90	15-40	NP-18
	42-80	Sandy clay loam, loam, sandy loam, clay loam	ML, SC, SM, CL	A-2, A-4, A-6	0	0	80-100	75-100	70-100	25-90	15-40	NP-18

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
AbbC: Abbie-----	0-14	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	85-100	55-85	25-35	5-13
	14-26	Sandy clay loam, loam, clay loam	CL	A-4, A-6	0	0	95-100	90-100	85-100	55-90	30-40	9-18
	26-38	Sandy clay loam, loam, clay loam	CL	A-4, A-6	0	0	95-100	90-100	85-100	55-90	30-40	9-18
	38-56	Loam, clay loam, sandy clay loam, sandy loam	CL, SC	A-2, A-4, A-6	0	0	95-100	90-100	80-100	30-90	25-40	8-18
	56-80	Loam, sandy loam, clay loam	SM, SC, ML, CL	A-2, A-4, A-6	0	0	80-100	75-100	70-100	25-90	15-40	NP-18
AbbC2: Abbie-----	0-12	Loam	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	85-100	55-85	25-35	5-13
	12-23	Loam, clay loam	CL	A-4, A-6	0	0	95-100	90-100	85-100	55-90	30-40	9-18
	23-37	Loam, clay loam	CL	A-4, A-6	0	0	95-100	90-100	85-100	55-90	30-40	9-18
	37-51	Loam, clay loam, sandy clay loam	CL, SC	A-2, A-4, A-6	0	0	95-100	90-100	80-100	30-90	25-40	8-18
	51-80	Sandy loam, loam, clay loam	CL, ML, SC, SM	A-2, A-4, A-6	0	0	80-100	75-100	70-100	25-90	15-40	NP-18
AbsB: Abilene-----	0-9	Silt loam	CL	A-4, A-6	0	0	98-100	96-100	90-100	60-96	25-35	8-16
	9-18	Silty clay loam, clay loam	CL	A-4, A-6	0	0	98-100	96-100	90-100	60-96	25-35	8-16
	18-26	Silty clay, clay, silty clay loam, clay loam	CH, CL	A-6, A-7	0	0	98-100	96-100	90-100	75-95	34-58	22-40
	26-57	Silty clay, clay, silty clay loam, clay loam	CL	A-6, A-7-6	0	0	90-100	88-100	80-98	60-95	35-50	19-32
	57-80	Silty clay, clay, silty clay loam, clay loam	CL, CH	A-6, A-7	0	0	98-100	96-100	90-100	75-95	34-58	22-40

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
AclA: Abbie-----	0-13	Clay loam	CL	A-4, A-6	0	0	95-100	90-100	85-100	65-90	31-40	9-18
	13-24	Loam, clay loam	CL	A-4, A-6	0	0	95-100	90-100	85-100	55-90	30-40	9-18
	24-61	Sandy clay loam, loam, clay loam	SC, CL	A-2, A-4, A-6	0	0	95-100	90-100	80-100	30-90	25-40	8-18
	61-67	Clay loam	SM, SC, ML, CL	A-2, A-4, A-6	0	0	80-100	75-100	70-100	25-90	15-40	NP-18
	67-80	Sandy clay loam	SM, CL, ML, SC	A-2, A-4, A-6	0	0	80-100	75-100	70-100	25-90	15-40	NP-18
AflB: Abbie-----	0-7	Fine sandy loam	SM, SC-SM, ML	A-2, A-4	0	0	95-100	90-100	85-100	30-60	0-26	NP-7
	7-14	Clay loam, loam, sandy clay loam	ML, SM, SC, CL	A-2, A-4, A-6	0	0	80-100	75-100	70-100	25-90	15-40	NP-18
	14-47	Loam, sandy clay loam, clay loam	CL, ML, SC, SM	A-2, A-4, A-6	0	0	80-100	75-100	70-100	25-90	15-40	NP-18
	47-80	Clay loam, loam, sandy clay loam	CL, ML, SM, SC	A-2, A-4, A-6	0	0	80-100	75-100	70-100	25-90	15-40	NP-18
AflC: Abbie-----	0-13	Fine sandy loam	SC-SM, SM, ML	A-2, A-4	0	0	95-100	90-100	85-100	30-60	0-26	NP-7
	13-27	Loam, clay loam	CL	A-4, A-6	0	0	95-100	90-100	85-100	55-90	30-40	9-18
	27-45	Loam, sandy clay loam, clay loam	CL, SC	A-2, A-4, A-6	0	0	95-100	90-100	80-100	30-90	25-40	8-18
	45-57	Sandy loam, loam, clay loam, sandy clay loam	SM, CL, ML, SC	A-2, A-4, A-6	0	0	80-100	75-100	70-100	25-90	15-40	NP-18
	57-80	Sandy loam, loam, clay loam, sandy clay loam	SM, SC, ML, CL	A-2, A-4, A-6	0	0	80-100	75-100	70-100	25-90	15-40	NP-18

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
BdaB: Berda-----	0-6	Loam	SC-SM, CL, CL-ML, SC	A-4, A-6	0	0-3	85-100	84-98	75-95	36-65	20-35	7-20
	6-19	Loam, sandy clay loam, clay loam			0	0	85-100	84-98	75-95	36-65	20-35	7-20
	19-39	Loam, clay loam, sandy clay loam			0	0	85-100	84-98	75-95	36-65	20-35	7-20
	39-80	Loam, clay loam, sandy clay loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20
BdaC: Berda-----	0-8	Loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0-3	85-100	84-98	75-95	36-65	20-35	7-20
	8-17	Loam, sandy clay loam, clay loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20
	17-25	Loam, sandy clay loam, clay loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20
	25-35	Loam, sandy clay loam, clay loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20
	35-80	Loam, sandy clay loam, clay loam	CL, CL-ML, SC-SM, SC	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20
BdaD: Berda-----	0-9	Loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-3	85-100	84-98	75-95	36-65	20-35	7-20
	9-25	Clay loam, loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20
	25-46	Loam, clay loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20
	46-80	Fine sandy loam, clay loam, loam, sandy clay loam	SC-SM, SC, CL, CL-ML	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
CRVE:												
Cottonwood-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0	98-100	95-100	80-100	55-85	20-35	4-15
	8-12	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-60	Gypsiferous material	---	---	---	---	---	---	---	---	---	---
Vinson-----	0-10	Loam	CL	A-4, A-6	0	0	100	100	96-100	65-97	30-37	8-14
	10-23	Silt loam, loam, clay loam	CL	A-4, A-6, A-7	0	0	100	100	96-100	65-98	30-43	8-20
	23-34	Silt loam, loam, clay loam	CL	A-4, A-6, A-7	0	0	100	100	96-100	65-98	30-43	8-20
	34-38	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
DAM:												
Dam-----	0-80	Variable	---	---	---	---	---	---	---	---	---	---
DevE:												
Devol-----	0-8	Loamy fine sand	SM, CL-ML, ML, SC-SM	A-2, A-4	0	0	98-100	98-100	94-100	30-60	15-26	NP-7
	8-23	Fine sandy loam, loamy fine sand	CL-ML, SM, SC-SM, ML	A-2, A-4	0	0	98-100	98-100	90-100	15-60	0-26	NP-7
	23-43	Loamy fine sand, fine sandy loam	SM, SC-SM, ML, CL-ML	A-2, A-4	0	0	98-100	98-100	90-100	15-60	0-26	NP-7
	43-80	Loamy fine sand, loamy sand, fine sand	SM, SC-SM	A-2, A-4	0	0	98-100	98-100	50-100	3-50	0-26	NP-7

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
DpwB: Deepwood-----	0-6	Loam	CL-ML, CL	A-4	0	0	100	100	96-100	65-85	24-31	4-10
	6-21	Loam, silt loam, very fine sandy loam	ML, CL-ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	21-43	Loam, silt loam, very fine sandy loam	CL-ML, ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	43-59	Loam, silt loam, very fine sandy loam	ML, CL-ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	59-80	Loam, silt loam, very fine sandy loam	ML, CL-ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
DpwC: Deepwood-----	0-10	Loam	CL-ML, CL	A-4	0	0	100	100	96-100	65-85	24-31	4-10
	10-23	Loam, silt loam, very fine sandy loam	ML, CL-ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	23-36	Loam, silt loam, very fine sandy loam	ML, CL-ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	36-60	Loam, silt loam, very fine sandy loam	ML, CL-ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	60-80	Loam, silt loam, very fine sandy loam	ML, CL-ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10



Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
DpwD: Deepwood-----	0-12	Loam	CL-ML, CL	A-4	0	0	100	100	96-100	65-85	24-31	4-10
	12-29	Loam, silt loam, very fine sandy loam	ML, CL-ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	29-51	Loam, silt loam, very fine sandy loam	CL, CL-ML, ML	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	51-80	Very fine sandy loam, silt loam, loam	ML, CL, CL-ML	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
DpwE: Deepwood-----	0-8	Loam	CL, CL-ML	A-4	0	0	100	100	96-100	65-85	24-31	4-10
	8-27	Loam, silt loam, very fine sandy loam	CL-ML, ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	27-53	Loam, silt loam, very fine sandy loam	ML, CL-ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	53-80	Loam, silt loam, very fine sandy loam	CL, CL-ML, ML	A-4	0	0	100	100	94-100	51-97	15-31	NP-10

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
DvlB: Devol-----	0-5	Fine sandy loam	ML, SC-SM, SM, CL-ML	A-2, A-4	0	0	98-100	98-100	94-100	30-60	15-26	NP-7
	5-13	Fine sandy loam, loamy fine sand	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	98-100	98-100	90-100	15-60	0-26	NP-7
	13-29	Fine sandy loam, loamy fine sand	SM, SC-SM, CL-ML, ML	A-2, A-4	0	0	98-100	98-100	90-100	15-60	0-26	NP-7
	29-42	Fine sandy loam, loamy sand, fine sand, loamy fine sand	SC-SM, SM	A-2, A-4	0	0	98-100	98-100	50-100	3-50	0-26	NP-7
	42-80	Loamy fine sand, loamy sand, fine sand	SC-SM, SM	A-2, A-4	0	0	98-100	98-100	50-100	3-50	0-26	NP-7
DvlC: Devol-----	0-6	Fine sandy loam	ML, SC-SM, SM, CL-ML	A-2, A-4	0	0	98-100	98-100	94-100	30-60	15-26	NP-7
	6-23	Fine sandy loam, loamy fine sand	ML, CL-ML, SM, SC-SM	A-2, A-4	0	0	98-100	98-100	90-100	15-60	0-26	NP-7
	23-38	Fine sandy loam, loamy fine sand	ML, SM, SC- SM, CL-ML	A-2, A-4	0	0	98-100	98-100	90-100	15-60	0-26	NP-7
	38-49	Loamy fine sand, loamy sand, fine sand	SM, SC-SM	A-2, A-4	0	0	98-100	98-100	50-100	3-50	0-26	NP-7
	49-80	Fine sandy loam, loamy fine sand, loamy sand, fine sand	SM, SC-SM	A-2, A-4	0	0	98-100	98-100	50-100	3-50	0-26	NP-7

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Dv1D: Devol-----	0-6	Fine sandy loam	CL-ML, SM, SC-SM, ML	A-2, A-4	0	0	98-100	98-100	94-100	30-60	15-26	NP-7
	6-16	Fine sandy loam, loamy fine sand	SC-SM, SM, CL-ML, ML	A-2, A-4	0	0	98-100	98-100	90-100	15-60	0-26	NP-7
	16-25	Fine sandy loam, loamy fine sand	SM, SC-SM, ML, CL-ML	A-2, A-4	0	0	98-100	98-100	90-100	15-60	0-26	NP-7
	25-43	Fine sandy loam, loamy sand, fine sand, loamy fine sand	SC-SM, SM	A-2, A-4	0	0	98-100	98-100	50-100	3-50	0-26	NP-7
	43-80	Loamy fine sand, loamy sand, fine sand	SC-SM, SM	A-2, A-4	0	0	98-100	98-100	50-100	3-50	0-26	NP-7
Ed1C: Eda-----	0-7	Loamy sand	SM	A-2	0	0	100	100	90-100	15-35	0-14	NP
	7-15	Loamy fine sand, loamy sand, sand	SP-SM, SM	A-2, A-3	0	0	100	100	82-98	3-35	0-14	NP
	15-23	Loamy fine sand, loamy sand, sand	SM, SP-SM	A-2, A-3	0	0	100	100	82-98	3-35	0-14	NP
	23-80	Fine sand, loamy sand, sand, loamy fine sand	SM, SP-SM	A-2, A-3	0	0	100	100	82-98	3-35	0-14	NP
Ed1E: Eda-----	0-10	Loamy sand	SM	A-2	0	0	100	100	90-100	15-35	0-14	NP
	10-19	Loamy fine sand, loamy sand, sand	SP-SM, SM	A-2, A-3	0	0	100	100	82-98	3-35	0-14	NP
	19-28	Loamy fine sand, loamy sand, sand	SP-SM, SM	A-2, A-3	0	0	100	100	82-98	3-35	0-14	NP
	28-45	Loamy sand, loamy fine sand, sand	SP-SM, SM	A-2, A-3	0	0	100	100	82-98	3-35	0-14	NP
	45-104	Sand, loamy sand, loamy fine sand	SM, SP-SM	A-2, A-3	0	0	100	100	82-98	3-35	0-14	NP

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
FayB: Farry-----	0-13	Fine sandy loam	SM, SC-SM, CL-ML, ML	A-2, A-4	0	0	98-100	95-100	85-100	30-60	0-26	NP-7
	13-35	Sandy clay loam, loam, sandy loam	SC, CL	A-2, A-4, A-6	0	0	95-100	85-100	70-90	30-85	25-37	7-16
	35-47	Sandy clay loam, sandy loam, loamy sand	SM, SC-SM, SC, CL-ML	A-2, A-4, A-6	0	0	95-100	85-100	60-90	15-60	15-37	NP-16
	47-80	Sandy loam, loam, loamy sand	SP-SM, SC-SM, SM, SC	A-2, A-4	0	0	90-100	80-100	50-80	10-50	15-30	NP-10
FayC: Farry-----	0-12	Fine sandy loam	SM, SC-SM, ML, CL-ML	A-2, A-4	0	0	98-100	95-100	85-100	30-60	0-26	NP-7
	12-19	Fine sandy loam, sandy clay loam, loam, sandy loam	SC, CL	A-2, A-4, A-6	0	0	95-100	85-100	70-90	30-85	25-37	7-16
	19-28	Sandy clay loam, sandy loam, loamy sand	SM, SC-SM, SC, CL-ML	A-2, A-4, A-6	0	0	95-100	85-100	60-90	15-60	15-37	NP-16
	28-42	Sandy loam, sandy clay loam, loamy sand	SM, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	95-100	85-100	60-90	15-60	15-37	NP-16
	42-80	Sandy loam, loam, loamy sand	SC, SP-SM, SM, SC-SM	A-2, A-4	0	0	90-100	80-100	50-80	10-50	15-30	NP-10

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
FoFE: Fortyone-----	0-8	Sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	100	75-100	60-90	25-55	0-25	NP-7
	8-16	Sandy loam, fine sandy loam, loam	ML, SC-SM, SM, CL-ML	A-2, A-4	0	0	95-100	75-100	50-95	25-75	0-28	NP-10
	16-24	Sandy loam, coarse sandy loam, loamy sand	SC-SM, SM	A-1, A-2	0	0	85-100	75-90	40-70	15-30	0-25	NP-7
	24-34	Gravelly sand, sandy loam, loamy sand	SC-SM, SP-SM, SM	A-1, A-2, A-3	0	0-5	60-100	45-85	30-70	5-30	0-20	NP-5
	34-80	Gravelly sand, sandy loam, loamy sand	SC-SM, SP-SM, SM	A-1, A-2, A-3	0	0-5	60-100	45-85	30-70	5-30	0-20	NP-5
Farry-----	0-10	Sandy loam	SC-SM, ML, SM, CL-ML	A-2, A-4	0	0	98-100	95-100	85-100	30-60	0-26	NP-7
	10-18	Sandy clay loam, loam, sandy loam	SC, CL	A-2, A-4, A-6	0	0	95-100	85-100	70-90	30-85	25-37	7-16
	18-25	Sandy loam, sandy clay loam, loamy sand	SM, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	95-100	85-100	60-90	15-60	15-37	NP-16
	25-36	Loamy coarse sand, loam, loamy sand, sandy loam	SM, SP-SM, SC-SM, SC	A-2, A-4	0	0	90-100	80-100	50-80	10-50	15-30	NP-10
	36-80	Loamy coarse sand, loam, loamy sand, sandy loam	SC, SP-SM, SM, SC-SM	A-2, A-4	0	0	90-100	80-100	50-80	10-50	15-30	NP-10

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
FrkA: Frankirk-----	0-8	Silt loam	CL, CL-ML	A-4, A-6	0	0	98-100	96-100	85-95	55-75	25-39	7-19
	8-15	Silty clay loam, loam	CL, CL-ML	A-4, A-6	0	0	98-100	96-100	85-95	55-75	25-39	7-19
	15-24	Silty clay loam, sandy clay, clay loam, clay	CL	A-6, A-7-6	0	0	98-100	96-100	90-100	65-80	36-47	18-26
	24-58	Silty clay loam, sandy clay, clay loam, clay	CL	A-6, A-7-6	0	0	98-100	96-100	90-100	65-80	36-47	18-26
	58-80	Silt loam, clay loam, loam, sandy clay loam	CL	A-6	0	0	95-100	90-100	85-98	55-75	25-38	11-22
FrkB: Frankirk-----	0-7	Silt loam	CL	A-6	0	0	98-100	96-100	90-100	60-80	30-40	12-20
	7-18	Silty clay loam, sandy clay, clay loam, clay	CL	A-6, A-7-6	0	0	98-100	96-100	90-100	65-80	36-47	18-26
	18-37	Silty clay loam, clay loam, sandy clay loam	CL	A-6	0	0	95-100	90-100	85-98	55-75	25-38	11-22
	37-65	Silty clay loam, clay loam, sandy clay loam, loam	CL	A-6	0	0	95-100	90-100	85-98	55-75	25-38	11-22
	65-80	Loam, clay loam, sandy clay loam	CL	A-6	0	0	95-100	90-100	85-98	55-75	25-38	11-22

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
FtnB: Fortyone-----	0-7	Sandy loam	SC-SM, SM, CL-ML, ML	A-2, A-4	0	0	100	75-100	60-90	25-55	0-25	NP-7
	7-13	Sandy loam, fine sandy loam, loam	CL-ML, SM, SC-SM, ML	A-2, A-4	0	0	95-100	75-100	50-95	25-75	0-28	NP-10
	13-21	Coarse sandy loam, sandy loam, loamy sand	SM, SC-SM	A-1, A-2	0	0	85-100	75-90	40-70	15-30	0-25	NP-7
	21-80	Gravelly sand, loamy sand, loamy coarse sand, sandy loam	SP-SM, SM, SC-SM	A-1, A-2, A-3	0	0-5	60-100	45-85	30-70	5-30	0-20	NP-5
FtnC: Fortyone-----	0-8	Sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	100	75-100	60-90	25-55	0-25	NP-7
	8-30	Sandy loam, fine sandy loam, loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	95-100	75-100	50-95	25-75	0-28	NP-10
	30-48	Coarse sandy loam, sandy loam, loamy sand	SC-SM, SM	A-1, A-2	0	0	85-100	75-90	40-70	15-30	0-25	NP-7
	48-80	Gravelly sand, loamy sand, sandy loam	SC-SM, SP-SM, SM	A-1, A-2, A-3	0	0-5	60-100	45-85	30-70	5-30	0-20	NP-5
FtnD: Fortyone-----	0-6	Sandy loam	SM, SC-SM, ML, CL-ML	A-2, A-4	0	0	100	75-100	60-90	25-55	0-25	NP-7
	6-18	Loam, fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	95-100	75-100	50-95	25-75	0-28	NP-10
	18-27	Sandy loam, fine sandy loam, loam	CL-ML, ML, SC-SM, SM	A-4, A-2	0	0	95-100	75-100	50-95	25-75	0-28	NP-10
	27-39	Sandy loam, coarse sandy loam, loamy sand	SM, SC-SM	A-1, A-2	0	0	85-100	75-90	40-70	15-30	0-25	NP-7
	39-80	Gravelly sand, loamy sand, sandy loam	SC-SM, SM, SP-SM	A-1, A-2, A-3	0	0-5	60-100	45-85	30-70	5-30	0-20	NP-5

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
GcsA: Gracemore-----	0-9	Fine sandy loam	CL	A-4, A-6	0	0	100	100	96-100	65-85	30-37	9-14
	9-16	Loamy fine sand, fine sand, sand	SM, SP-SM	A-2, A-3	0	0	90-100	85-100	82-100	5-35	0-0	NP
	16-25	Fine sand, sand, loamy fine sand	SM, SP-SM	A-2, A-3	0	0	90-100	85-100	82-100	5-35	0-0	NP
	25-36	Clay loam	CL	A-4, A-6	0	0	95-100	90-100	85-100	65-90	31-40	9-18
	36-80	Fine sandy loam	SM, SP-SM	A-2, A-3	0	0	90-100	85-100	82-100	5-35	0-0	NP
GdfB: Grandfield-----	0-12	Fine sandy loam	SM, SC-SM, ML, CL-ML	A-4	0	0	100	98-100	94-100	36-60	15-26	NP-7
	12-47	Sandy clay loam, fine sandy loam	SC, SM, CL, ML	A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	47-56	Clay loam, fine sandy loam, sandy clay loam	SM, CL, ML, SC	A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	56-68	Sandy loam, fine sandy loam, sandy clay loam	CL, ML, SC, SM	A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	68-94	Sandy loam, fine sandy loam, sandy clay loam	CL, ML, SC, SM	A-4	0	0	100	98-100	90-100	36-60	15-30	NP-10
GdfC: Grandfield-----	0-8	Fine sandy loam	CL-ML, SM, SC-SM, ML	A-4	0	0	100	98-100	94-100	36-60	15-26	NP-7
	8-25	Sandy clay loam, fine sandy loam	CL, SC, SM, ML	A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	25-43	Sandy clay loam, fine sandy loam	ML, CL, SM, SC	A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	43-61	Sandy clay loam, fine sandy loam	SM, SC, CL, ML	A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	61-80	Sandy loam, fine sandy loam, sandy clay loam	CL, ML, SC, SM	A-4	0	0	100	98-100	90-100	36-60	15-30	NP-10



Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
GDGE: Grandfield-----	0-8	Loam	SM, SC-SM, CL-ML, ML	A-4	0	0	100	98-100	94-100	36-60	15-26	NP-7
	8-16	Loam, sandy clay loam, clay loam	CL, SC, ML, SM	A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	16-36	Clay loam, sandy clay loam	SM, SC, CL, ML	A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	36-60	Loam, clay loam, sandy clay loam, fine sandy loam	CL, ML, SC, SM	A-4	0	0	100	98-100	90-100	36-60	15-30	NP-10
	60-80	Fine sandy loam	ML, CL, SC, SM	A-4	0	0	100	98-100	90-100	36-60	15-30	NP-10
Devol-----	0-13	Fine sandy loam	SC-SM, SM, CL-ML, ML	A-2, A-4	0	0	98-100	98-100	94-100	30-60	15-26	NP-7
	13-29	Fine sandy loam	SC-SM, CL-ML, ML, SM	A-2, A-4	0	0	98-100	98-100	90-100	15-60	0-26	NP-7
	29-38	Fine sandy loam, loamy fine sand	SC-SM, SM	A-2, A-4	0	0	98-100	98-100	50-100	15-50	0-26	NP-7
	38-45	Loamy fine sand	SM, SC-SM	A-2, A-4	0	0	98-100	98-100	50-100	15-50	0-26	NP-7
	45-80	Loamy fine sand, fine sand	ML, CL-ML, SC-SM, SM	A-2, A-4	0	0	98-100	98-100	90-100	3-60	0-26	NP-7
Grandmore-----	0-15	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	98-100	94-100	36-60	15-26	NP-7
	15-30	Fine sandy loam, sandy clay loam	SM, SC, CL, ML	A-6, A-4	0	0	100	98-100	90-100	36-65	15-37	NP-16
	30-54	Sandy clay loam, clay loam, clay	CL, CH	A-6, A-7	0	0	100	100	96-100	80-95	31-60	11-34
	54-70	Clay loam, clay	CL, CH	A-6, A-7	0	0	100	100	96-100	80-95	31-60	11-34
	70-80	Fine sandy loam	CL, CH	A-6, A-7	0	0	100	100	96-100	80-95	31-60	11-34

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
GdmB: Grandmore-----	0-10	Fine sandy loam	SM, SC-SM, ML, CL-ML	A-4	0	0	100	98-100	94-100	36-60	15-26	NP-7
	10-22	Fine sandy loam, sandy clay loam, loam	SM, SC, CL, ML	A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	22-34	Loam, sandy clay loam, fine sandy loam	SM, SC, ML, CL	A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	34-47	Loam, sandy clay loam, fine sandy loam	SM, SC, ML, CL	A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	47-80	Loam, sandy clay loam, fine sandy loam	SC, SM, CL, ML	A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
GfsA: Gracemore-----	0-8	Fine sandy loam	CL, CL-ML, ML	A-4, A-6	0	0	90-100	85-100	85-100	65-90	22-40	2-18
	8-22	Fine sand, loamy fine sand	SP-SM, SM	A-2, A-3	0	0	90-100	85-100	82-100	3-35	0-26	NP-7
	22-80	Fine sand, loamy fine sand	SP-SM, SM	A-3, A-2	0	0	90-100	85-100	82-100	3-35	0-26	NP-7
GmrA: Gracemont-----	0-7	Fine sandy loam	SC-SM, SM, ML, CL-ML	A-4	0	0	100	98-100	94-100	36-60	15-26	NP-7
	7-29	Fine sandy loam, loam	SM, SC-SM, ML, CL-ML	A-4	0	0	100	98-100	94-100	36-90	22-29	2-7
	29-45	Fine sandy loam, clay loam, loam	SM, SC, CL, ML	A-4, A-6	0	0	100	98-100	94-100	36-90	22-40	2-18
	45-80	Fine sandy loam, clay loam, loam	CL, ML, SC, SM	A-4, A-6	0	0	100	98-100	94-100	36-90	22-40	2-18

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
GmsA: Gracemont-----	0-7	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	98-100	94-100	36-90	15-26	NP-7
	7-22	Fine sandy loam, loam	ML, SC-SM, SM, CL-ML	A-4	0	0	100	98-100	94-100	36-90	22-29	2-7
	22-31	Loam, fine sandy loam, clay loam	SC, CL, ML, SM	A-4, A-6	0	0	100	98-100	94-100	36-90	22-40	2-18
	31-62	Clay loam, loam, fine sandy loam	CL, SM, SC, ML	A-4, A-6	0	0	100	98-100	94-100	36-90	22-40	2-18
	62-80	Loamy sand, fine sandy loam, loam, clay loam	ML, SM, SC, CL	A-4, A-6	0	0	100	98-100	94-100	36-90	22-40	2-18
GrmA: Gracemore-----	0-13	Fine sandy loam	ML, CL, CL-ML	A-4, A-6	0	0	90-100	85-100	85-100	65-90	22-40	2-18
	13-20	Loamy fine sand, fine sand	SM, SP-SM	A-2, A-3	0	0	90-100	85-100	82-100	3-35	0-14	NP
	20-30	Fine sand, loamy fine sand	SM, SP-SM	A-2, A-3	0	0	90-100	85-100	82-100	3-35	0-14	NP
	30-49	Clay loam	CL	A-6, A-4	0	0	95-100	90-100	85-100	65-90	31-40	9-18
	49-80	Fine sandy loam	SM, SP-SM	A-2, A-3	0	0	90-100	85-100	82-100	5-35	0-7	NP

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
HdGB: Hardeman-----	0-7	Loamy sand	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-25	2-7
	7-18	Loamy coarse sand, fine sandy loam, very fine sandy loam, loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
	18-37	Sandy loam, very fine sandy loam, loam, fine sandy loam	SM, SC-SM, CL-ML, ML	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
	37-47	Loamy sand, very fine sandy loam, loam, fine sandy loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
	47-106	Loamy sand, very fine sandy loam, loam, fine sandy loam	SC-SM, ML, SM, CL-ML	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
Grandmore-----	0-18	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	98-100	94-100	36-60	15-26	NP-7
	18-27	Fine sandy loam, sandy clay loam	SM, SC, ML, CL	A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	27-49	Sandy clay loam, fine sandy loam	SM, SC, ML, CL	A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	49-60	Clay loam, fine sandy loam, sandy clay loam	SM, CL, ML, SC	A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	60-80	Clay loam, clay	CL, CH	A-6, A-7	0	0	100	100	96-100	80-95	31-60	11-34

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
HdGC: Hardeman-----	0-6	Fine sandy loam	CL-ML, SC-SM, SM, ML	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-25	2-7
	6-13	Fine sandy loam, very fine sandy loam, loam	SM, SC-SM, ML, CL-ML	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
	13-24	Fine sandy loam, very fine sandy loam, loam	ML, SM, SC- SM, CL-ML	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
	24-48	Fine sandy loam, very fine sandy loam, loam	SC-SM, ML, CL-ML, SM	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
	48-80	Fine sandy loam, very fine sandy loam, loam	SM, SC-SM, CL-ML, ML	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
Grandmore-----	0-15	Fine sandy loam	SM, SC-SM, ML, CL-ML	A-4	0	0	100	98-100	94-100	36-60	15-26	NP-7
	15-30	Fine sandy loam, sandy clay loam	SM, SC, ML, CL	A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	30-54	Sandy clay loam, clay, clay loam	CL, CH	A-6, A-7	0	0	100	100	96-100	80-95	31-60	11-34
	54-70	Clay loam, clay	CL, CH	A-6, A-7	0	0	100	100	96-100	80-95	31-60	11-34
	70-80	Fine sandy loam, sandy clay loam	SM, SC, ML, CL	A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
HdmB: Hardeman-----	0-9	Fine sandy loam	SM, SC-SM, ML, CL-ML	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-25	2-7
	9-24	Fine sandy loam, very fine sandy loam, loam	CL-ML, SM, SC-SM, ML	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
	24-42	Fine sandy loam, very fine sandy loam, loam	ML, SC-SM, SM, CL-ML	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
	42-53	Fine sandy loam, very fine sandy loam, loam	SM, SC-SM, CL-ML, ML	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
	53-80	Fine sandy loam, very fine sandy loam, loam	SC-SM, ML, CL-ML, SM	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
HdmC: Hardeman-----	0-9	Fine sandy loam	SM, ML, SC- SM, CL-ML	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-25	2-7
	9-27	Fine sandy loam, very fine sandy loam, loam	CL-ML, SM, SC-SM, ML	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
	27-34	Fine sandy loam, very fine sandy loam, loam	SC-SM, SM, ML, CL-ML	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
	34-59	Fine sandy loam, very fine sandy loam, loam	SM, SC-SM, ML, CL-ML	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
	59-80	Fine sandy loam, very fine sandy loam, loam	SM, SC-SM, ML, CL-ML	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
IreA: Irene-----	0-8	Silt loam	CL-ML, ML, CL	A-4, A-6	0	0	100	100	96-100	80-97	22-37	2-13
	8-14	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	98-100	90-98	33-42	12-19
	14-23	Silty clay loam, clay loam	CL	A-6, A-7	0	0	100	100	96-100	80-98	33-43	12-20
	23-49	Silty clay loam, clay loam	CL	A-6, A-7	0	0	95-100	90-100	90-100	70-98	33-43	12-20
	49-80	Silt loam, clay loam, sandy clay loam, loam	SC, CL, SM, ML	A-2, A-4, A-6	0	0	90-100	85-100	80-100	30-90	22-40	2-18
IreB: Irene-----	0-9	Silt loam	CL	A-6, A-4	0	0	100	100	96-100	80-97	22-37	2-13
	9-14	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	98-100	90-98	33-42	12-19
	14-29	Silty clay loam, clay loam	CL	A-6, A-7	0	0	100	100	96-100	80-98	33-43	12-20
	29-44	Silty clay loam, clay loam	CL	A-6, A-7	0	0	95-100	90-100	90-100	70-98	33-43	12-20
	44-80	Silty clay loam, clay loam	CL	A-6, A-7	0	0	95-100	90-100	90-100	70-98	33-43	12-20
IreC: Irene-----	0-15	Silt loam	CL	A-6, A-4	0	0	100	100	96-100	80-97	22-37	2-13
	15-23	Silty clay loam	CL	A-6, A-7	0	0	100	100	98-100	90-98	33-42	12-19
	23-46	Silty clay loam, clay loam	CL	A-6, A-7	0	0	100	100	96-100	80-98	33-43	12-20
	46-59	Silt loam, silty clay loam, clay loam	CL	A-6, A-7	0	0	95-100	90-100	90-100	70-98	33-43	12-20
	59-80	Silt loam, clay loam, sandy clay loam, loam	SM, SC, ML, CL	A-2, A-4, A-6	0	0	90-100	85-100	80-100	30-90	22-40	2-18

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
IreD: Irene-----	0-11	Silt loam	CL	A-6, A-4	0	0	100	100	96-100	80-97	22-37	2-13
	11-22	Silty clay loam, clay loam	CL	A-6, A-7	0	0	100	100	98-100	90-98	33-42	12-19
	22-36	Silty clay loam, clay loam	CL	A-6, A-7	0	0	100	100	96-100	80-98	33-43	12-20
	36-51	Silty clay loam, clay loam	CL	A-6, A-7	0	0	95-100	90-100	90-100	70-98	33-43	12-20
	51-80	Silt loam, sandy clay loam, clay loam, loam	CL, ML, SC, SM	A-2, A-4, A-6	0	0	90-100	85-100	80-100	30-90	22-40	2-18
JssF: Jester-----	0-5	Sand	SM	A-2, A-3	0	0	100	98-100	82-98	5-25	0-0	NP
	5-16	Sand, fine sand, loamy fine sand	SP-SM, SM	A-2, A-3	0	0	100	98-100	82-100	3-35	0-14	NP
	16-42	Sand, fine sand, loamy fine sand	SM, SP-SM	A-2, A-3	0	0	100	98-100	82-100	3-35	0-14	NP
	42-57	Stratified sand to loamy fine sand	SM, SP-SM	A-2, A-3	0	0	100	98-100	82-100	3-35	0-14	NP
	57-80	Stratified coarse sand to loamy fine sand	SP-SM, SM	A-2, A-3	0	0	100	98-100	82-100	3-35	0-14	NP
JstC: Jester-----	0-7	Loamy fine sand	SM	A-2	0	0	100	98-100	90-100	15-35	0-14	NP
	7-40	Loamy fine sand, fine sand, sand	SM, SP-SM	A-2, A-3	0	0	100	98-100	82-100	3-35	0-14	NP
	40-80	Fine sand, loamy fine sand, sand	SM, SP-SM	A-2, A-3	0	0	100	98-100	82-100	3-35	0-14	NP



Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
KidB: Kingsdown-----	0-14	Fine sandy loam	SM, CL-ML, ML, SC-SM	A-2, A-4	0	0	100	95-100	65-100	30-55	14-26	NP-7
	14-23	Fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	100	95-100	65-100	25-55	14-26	NP-7
	23-32	Fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	100	95-100	65-100	25-55	14-26	NP-7
	32-43	Fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	100	95-100	65-100	25-55	14-26	NP-7
	43-80	Fine sandy loam, loamy fine sand, sandy loam, loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	100	95-100	55-100	15-55	0-29	NP-7
KiHE: Kingsdown-----	0-10	Loam	SM, ML, SC-SM	A-2, A-4	0	0	100	95-100	65-100	30-55	22-31	2-7
	10-25	Loam, fine sandy loam	SM, ML, CL- ML, SC-SM	A-2, A-4	0	0	100	95-100	55-100	15-55	14-31	NP-10
	25-38	Sandy loam, fine sandy loam	SM, CL-ML, ML, SC-SM	A-2, A-4	0	0	100	95-100	55-100	15-55	14-26	NP-7
	38-80	Coarse sandy loam, loamy fine sand, sandy loam, fine sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	100	95-100	65-100	25-55	0-26	NP-7
Hardeman-----	0-6	Loam	SM, SC-SM, CL-ML, ML	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-25	2-7
	6-16	Loam, fine sandy loam	SM, CL-ML, ML, SC-SM	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
	16-39	Fine sandy loam, loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
	39-80	Fine sandy loam	ML, CL-ML, SC-SM, SM	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
LgtA: Lugert-----	0-11	Silt loam	ML, CL-ML	A-4	0	0	100	100	94-100	51-95	15-28	NP-7
	11-36	Very fine sandy loam, loam, silt loam	ML, CL-ML, CL	A-4	0	0	100	100	94-100	51-95	15-30	NP-10
	36-48	Very fine sandy loam, loam, silt loam	ML, CL, CL-ML	A-4	0	0	100	100	94-100	51-95	15-30	NP-10
	48-69	Loam, very fine sandy loam, silt loam	CL-ML, ML, CL	A-4	0	0	100	100	94-100	51-95	15-30	NP-10
	69-88	Loam, very fine sandy loam, silt loam	ML, CL-ML, CL	A-4	0	0	100	100	94-100	51-95	15-30	NP-10
LiJC: Lincoln-----	0-11	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	95-100	85-100	80-100	36-60	15-24	NP-7
	11-19	Loamy fine sand, stratified fine sand to clay loam	SP-SM, SM	A-2, A-3	0	0	95-100	85-100	82-100	5-35	0-34	NP-10
	19-80	Loamy coarse sand, stratified fine sand to clay loam	SP-SM, SM	A-2, A-3	0	0	95-100	85-100	82-100	5-35	0-34	NP-10
Jester-----	0-6	Loamy fine sand	SM	A-2	0	0	100	98-100	90-100	15-35	0-14	NP
	6-19	Loamy fine sand, fine sand, sand	SP-SM, SM	A-2, A-3	0	0	100	98-100	82-100	3-35	0-14	NP
	19-30	Loamy fine sand, fine sand, sand	SM, SP-SM	A-2, A-3	0	0	100	98-100	82-100	3-35	0-14	NP
	30-80	Loamy fine sand, fine sand, sand	SM, SP-SM	A-2, A-3	0	0	100	98-100	82-100	3-35	0-14	NP

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
LikB: Likes-----	0-7	Fine sandy loam	SP-SM, SC-SM, SM	A-2-4	0	0-2	90-100	90-100	75-95	10-30	0-25	NP-6
	7-16	Loamy fine sand, loamy sand, fine sand	SC-SM, SP-SM, SM	A-2-4	0	0-2	90-100	90-100	75-95	3-30	0-25	NP-6
	16-28	Loamy fine sand, loamy sand, fine sand	SC-SM, SM, SP-SM	A-2-4	0	0-2	90-100	90-100	75-95	3-30	0-25	NP-6
	28-42	Loamy fine sand, loamy sand, fine sand	SC-SM, SM, SP-SM	A-2-4	0	0-2	90-100	90-100	75-95	3-30	0-25	NP-6
	42-80	Loamy fine sand, loamy sand, fine sand	SC-SM, SM, SP-SM	A-2-4	0	0-2	90-100	90-100	75-95	3-30	0-25	NP-6
LisA: Lincoln-----	0-4	Sand	ML, CL-ML, SM, SC-SM	A-4	0	0	95-100	85-100	80-100	36-60	15-24	NP-7
	4-10	Loamy fine sand, sand, stratified fine sand to clay loam	SM, SP-SM	A-2, A-3	0	0	95-100	85-100	82-100	5-35	0-34	NP-10
	10-80	Sand, loamy fine sand, stratified fine sand to clay loam	SM, SP-SM	A-2, A-3	0	0	95-100	85-100	82-100	5-35	0-34	NP-10

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
LncA: Lincoln-----	0-8	Clay loam	CL	A-6	0	0	100	100	96-100	80-98	30-40	10-18
	8-19	Loamy fine sand, stratified fine sand to clay loam	SP-SM, SM	A-2, A-3	0	0	100	98-100	82-100	5-35	0-34	NP
	19-28	Loamy fine sand, stratified fine sand to clay loam	SP-SM, SM	A-2, A-3	0	0	100	98-100	82-100	5-35	0-34	NP
	28-34	Loamy fine sand, stratified fine sand to clay loam	SP-SM, SM	A-2, A-3	0	0	100	98-100	82-100	5-35	0-34	NP
	34-80	Loamy coarse sand, stratified fine sand to clay loam	SM, SP-SM	A-2, A-3	0	0	100	98-100	82-100	5-35	0-34	NP
LROE: Laverne-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0-5	90-100	75-100	70-95	51-75	20-35	4-17
	8-15	Gravelly loam, very gravelly loam, gravelly clay loam, very gravelly clay loam	CL, SC-SM, SC, CL-ML	A-4, A-6	0	0-5	90-98	65-95	50-90	40-75	20-35	4-17
	15-25	Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-24	Bedrock	---	---	---	---	---	---	---	---	---	---

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
LshA: Lesho-----	0-11	Clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	70-80	35-45	15-22
	11-17	Clay loam, loam	CL	A-4, A-6, A-7-6	0	0	100	100	85-100	60-80	25-45	7-22
	17-23	Fine sandy loam, loam, clay loam	CL	A-4, A-6, A-7-6	0	0	100	100	85-100	60-80	25-45	7-22
	23-34	Clay loam, loam	CL	A-4, A-6, A-7-6	0	0	100	100	85-100	60-80	25-45	7-22
	34-80	Loamy coarse sand, sand, fine sand	SP-SM, SM	A-1, A-2, A-3, A-4	0	0	100	95-100	30-85	3-45	0-10	NP
LsoA: Lincoln-----	0-7	Sand	SM, SC-SM, CL-ML, ML	A-4	0	0	95-100	85-100	80-100	36-60	15-24	NP-7
	7-20	Fine sand, sand, stratified fine sand to clay loam	SM, SP-SM	A-2, A-3	0	0	95-100	85-100	82-100	3-35	0-34	NP-10
	20-31	Sand, fine sand, stratified fine sand to clay loam	SM, SP-SM	A-2, A-3	0	0	95-100	85-100	82-100	3-35	0-34	NP-10
	31-48	Fine sand, sand, stratified fine sand to clay loam	SM, SP-SM	A-2, A-3	0	0	95-100	85-100	82-100	3-35	0-34	NP-10
	48-80	Stratified fine sand to clay loam, sand, fine sand	SM, SP-SM	A-2, A-3	0	0	95-100	85-100	82-100	3-35	0-34	NP-10
M-W: Water.												

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MLBB: Mobeetie-----	0-6	Loam	SC-SM, SC, CL, CL-ML	A-2-4, A-4	0	0-5	95-100	90-100	75-95	25-55	20-27	4-10
	6-11	Loam, fine sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0-5	95-100	90-100	75-95	25-55	20-27	4-10
	11-21	Fine sandy loam, loam	SC-SM, SC, CL-ML, CL	A-2-4, A-4	0	0-5	90-100	85-100	70-95	25-55	20-27	4-10
	21-34	Loam, fine sandy loam	SC-SM, SC, CL, CL-ML	A-2-4, A-4	0	0-5	90-100	85-100	70-95	25-55	20-27	4-10
	34-80	Loamy coarse sand, loam, fine sandy loam	CL, CL-ML, SC-SM, SC	A-2-4, A-4	0	0-5	90-100	85-100	70-95	25-55	20-27	4-10
Likes-----	0-5	Loamy sand	SP-SM, SM, SC-SM	A-2-4	0	0-2	90-100	90-100	75-95	10-30	0-25	NP-6
	5-11	Fine sandy loam, loamy fine sand, loamy sand, fine sand	SC-SM, SM, SP-SM	A-2-4	0	0-2	90-100	90-100	75-95	3-30	0-25	NP-6
	11-80	Loamy coarse sand, loamy fine sand, loamy sand, fine sand	SP-SM, SM, SC-SM	A-2-4	0	0-2	90-100	90-100	75-95	3-30	0-25	NP-6
Berda-----	0-8	Loam	CL, SC, SC- SM, CL-ML	A-2-4, A-4, A-6	0	0-3	85-100	84-98	70-95	30-60	18-30	4-14
	8-15	Gravelly fine sandy loam, clay loam, sandy clay loam, loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20
	15-28	Clay loam, loam, sandy clay loam	SC-SM, SC, CL, CL-ML	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20
	28-34	Clay loam, loam, sandy clay loam	SC-SM, CL, CL-ML, SC	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20
	34-80	Loamy fine sand, clay loam, sandy clay loam, loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MLBC: Mobeetie-----	0-6	Fine sandy loam	CL-ML, SC, SC-SM, CL	A-2-4, A-4	0	0-5	95-100	90-100	75-95	25-55	20-27	4-10
	6-19	Fine sandy loam, loam	SC-SM, CL, CL-ML, SC	A-2-4, A-4	0	0-5	95-100	90-100	75-95	25-55	20-27	4-10
	19-25	Loamy coarse sand, fine sandy loam, loam	SC-SM, SC, CL-ML, CL	A-2-4, A-4	0	0-5	95-100	90-100	75-95	25-55	20-27	4-10
	25-36	Fine sandy loam, loam	SC-SM, SC, CL, CL-ML	A-2-4, A-4	0	0-5	95-100	90-100	75-95	25-55	20-27	4-10
	36-80	Loamy coarse sand, fine sandy loam, loam	SC-SM, SC, CL-ML, CL	A-2-4, A-4	0	0-5	90-100	85-100	70-95	25-55	20-27	4-10
Likes-----	0-7	Fine sandy loam	SC-SM, SM, SP-SM	A-2-4	0	0-2	90-100	90-100	75-95	10-30	0-25	NP-6
	7-18	Loamy coarse sand, loamy fine sand, loamy sand, fine sand	SM, SP-SM, SC-SM	A-2-4	0	0-2	90-100	90-100	75-95	3-30	0-25	NP-6
	18-80	Loamy coarse sand, loamy fine sand, loamy sand, fine sand	SC-SM, SM, SP-SM	A-2-4	0	0-2	90-100	90-100	75-95	3-30	0-25	NP-6

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MLBC: Berda-----	0-6	Fine sandy loam	SC, SC-SM, CL-ML, CL	A-2-4, A-4, A-6	0	0-3	85-100	84-98	70-95	30-60	18-30	4-14
	6-15	Gravelly fine sandy loam, loam, clay loam, sandy clay loam	SC-SM, SC, CL, CL-ML	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20
	15-27	Clay loam, loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20
	27-34	Clay loam, loam, sandy clay loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20
	34-80	Loamy fine sand, clay loam, sandy clay loam, loam	CL-ML, CL, SC, SC-SM	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20
MLBE: Mobeetie-----	0-5	Fine sandy loam	SC, CL, CL- ML, SC-SM	A-2-4, A-4	0	0-5	95-100	90-100	75-95	25-55	20-27	4-10
	5-12	Fine sandy loam, loam	CL, CL-ML, SC-SM, SC	A-2-4, A-4	0	0-5	95-100	90-100	75-95	25-55	20-27	4-10
	12-23	Fine sandy loam, loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0-5	95-100	90-100	75-95	25-55	20-27	4-10
	23-39	Sandy loam, fine sandy loam, loam	SC-SM, SC, CL-ML, CL	A-2-4, A-4	0	0-5	95-100	90-100	75-95	25-55	20-27	4-10
	39-80	Loamy coarse sand, fine sandy loam, loam	CL-ML, SC-SM, SC, CL	A-2-4, A-4	0	0-5	90-100	85-100	70-95	25-55	20-27	4-10



Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MLBE: Likes-----	0-6	Fine sandy loam	SC-SM, SM, SP-SM	A-2-4	0	0-2	90-100	90-100	75-95	10-30	0-25	NP-6
	6-11	Loamy fine sand, loamy sand, fine sand	SP-SM, SM, SC-SM	A-2-4	0	0-2	90-100	90-100	75-95	3-30	0-25	NP-6
	11-27	Loamy fine sand, loamy sand, fine sand	SP-SM, SM, SC-SM	A-2-4	0	0-2	90-100	90-100	75-95	3-30	0-25	NP-6
	27-80	Loamy coarse sand, loamy fine sand, fine sand	SC-SM, SP-SM, SM	A-2-4	0	0-2	90-100	90-100	75-95	3-30	0-25	NP-6
Berda-----	0-5	Fine sandy loam	SC-SM, SC, CL-ML, CL	A-2-4, A-4, A-6	0	0-3	85-100	84-98	70-95	30-60	18-30	4-14
	5-12	Fine sandy loam, loam, clay loam, sandy clay loam	SC-SM, CL-ML, SC, CL	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20
	12-29	Sandy clay loam, clay loam, loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20
	29-39	Clay loam, loam, sandy clay loam	SC, SC-SM, CL-ML, CL	A-6, A-4	0	0	85-100	84-98	75-95	36-65	20-35	7-20
	39-80	Loamy coarse sand, loam, clay loam, sandy clay loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MnsB: Mansic-----	0-14	Clay loam	CL	A-6	0	0	100	95-100	85-100	65-80	35-40	15-20
	14-23	Clay loam, loam, very fine sandy loam	CL	A-6	0	0	100	95-100	80-100	50-80	30-40	10-20
	23-35	Clay loam, loam, very fine sandy loam	CL	A-6	0	0	100	95-100	80-100	50-80	30-40	10-20
	35-40	Loam, clay loam, very fine sandy loam	CL	A-6	0	0	100	95-100	80-100	50-80	30-40	10-20
	40-80	Loam, clay loam, very fine sandy loam	CL	A-6	0	0	100	95-100	80-100	50-80	30-40	10-20
MnsC: Mansic-----	0-7	Clay loam	CL	A-6	0	0	100	95-100	85-100	65-80	35-40	15-20
	7-21	Clay loam, loam, very fine sandy loam	CL	A-6	0	0	100	95-100	80-100	50-80	30-40	10-20
	21-36	Loam, clay loam, very fine sandy loam	CL	A-6	0	0	100	95-100	80-100	50-80	30-40	10-20
	36-80	Loam, clay loam, very fine sandy loam	CL	A-6	0	0	100	95-100	80-100	50-80	30-40	10-20

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MsnB: Manson-----	0-7	Loam	CL	A-6	0	0	98-100	98-100	90-100	55-90	30-40	11-20
	7-13	Loam, sandy clay loam, clay loam	CL	A-6	0	0	95-100	90-100	88-100	60-90	30-40	16-25
	13-23	Sandy clay loam, clay loam	CL	A-6	0	0	90-100	85-100	85-100	60-90	30-40	16-25
	23-41	Sandy clay loam, clay loam	CL	A-6	0	0	90-100	85-100	85-100	60-90	30-40	16-25
	41-80	Sandy clay loam, clay loam	CL	A-6	0	0	90-100	85-100	85-100	60-90	30-40	16-25
MsnC: Manson-----	0-11	Loam	CL	A-6	0	0	98-100	98-100	90-100	55-90	30-40	11-20
	11-19	Sandy clay loam, clay loam	CL	A-6	0	0	95-100	90-100	88-100	60-90	30-40	16-25
	19-35	Clay loam, sandy clay loam	CL	A-6	0	0	90-100	85-100	85-100	60-90	30-40	16-25
	35-66	Clay loam, sandy clay loam	CL	A-6	0	0	90-100	85-100	85-100	60-90	30-40	16-25
	66-80	Gravelly clay loam, sandy clay loam, clay loam	CL	A-6	0	0	90-100	85-100	85-100	60-90	30-40	16-25
MsnC2: Manson-----	0-12	Loam	CL	A-6	0	0	98-100	98-100	90-100	55-90	30-40	11-20
	12-30	Clay loam, sandy clay loam	CL	A-6	0	0	95-100	90-100	88-100	60-90	30-40	16-25
	30-44	Clay loam, sandy clay loam	CL	A-6	0	0	90-100	85-100	85-100	60-90	30-40	16-25
	44-55	Clay loam, sandy clay loam	CL	A-6	0	0	90-100	85-100	85-100	60-90	30-40	16-25
	55-80	Clay loam, sandy clay loam	CL	A-6	0	0	90-100	85-100	85-100	60-90	30-40	16-25

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
OMBE: Oklark-----	0-10	Sandy loam	CL	A-6	0	0	95-100	90-100	85-100	70-90	31-40	10-18
	10-28	Sandy loam, loam, fine sandy loam	SM, SC-SM, CL-ML, ML	A-2, A-4	0	0	95-100	90-100	80-100	30-85	15-29	NP-7
	28-41	Sandy loam, loam, fine sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	95-100	90-100	80-100	30-85	15-29	NP-7
	41-80	Sandy loam, loam, fine sandy loam	CL-ML, SC-SM, SM, ML	A-2, A-4	0	0	95-100	90-100	80-100	30-85	15-29	NP-7
Mansic-----	0-12	Loam	CL	A-6	0	0	98-100	98-100	85-100	65-90	31-40	10-18
	12-28	Clay loam, loam	CL	A-4, A-6, A-7	0	0	98-100	90-100	85-100	60-90	28-43	9-20
	28-56	Clay loam, loam, sandy loam	SC-SM, CL-ML, CL	A-4, A-6, A-7	0	0	98-100	98-100	90-100	35-85	20-43	5-20
	56-80	Loam, clay loam, sandy loam	SC-SM, CL-ML, CL	A-2, A-4, A-6	0	0	98-100	90-100	80-100	30-85	16-40	4-18
Berda-----	0-9	Loam	CL, CL-ML	A-4, A-6	0	0	90-100	90-100	85-100	55-85	20-35	5-15
	9-27	Loam, clay loam	CL	A-6, A-7-6	0	0	90-100	90-100	85-100	55-85	25-45	10-25
	27-47	Loam, clay loam	CL	A-6, A-7-6	0	0	90-100	90-100	85-100	55-85	25-45	10-25
	47-80	Sandy loam, clay loam, loam	CL	A-6, A-7-6	0	0	90-100	90-100	85-100	55-85	25-45	10-25
OMBG: Oklark-----	0-10	Sandy loam	ML, CL-ML	A-4	0	0	95-100	90-100	85-100	60-85	22-29	2-7
	10-21	Sandy loam, loam, fine sandy loam	SM, SC-SM, CL-ML, ML	A-2, A-4	0	0	95-100	90-100	80-100	30-85	15-29	NP-7
	21-80	Fine sandy loam, sandy loam, loam	SM, SC-SM, ML, CL-ML	A-2, A-4	0	0	95-100	90-100	80-100	30-85	15-29	NP-7

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
OMBG: Mansic-----	0-12	Loam	CL-ML, CL	A-4, A-6	0	0	98-100	90-100	85-100	60-85	25-35	7-15
	12-21	Sandy clay loam, clay loam, loam	CL	A-4, A-6, A-7	0	0	98-100	90-100	85-100	60-90	28-43	9-20
	21-39	Sandy clay loam, clay loam, loam	CL-ML, SC-SM, CL	A-4, A-6, A-7	0	0	98-100	98-100	90-100	35-85	20-43	5-20
	39-80	Sandy loam, clay loam, loam	SC-SM, CL-ML, CL	A-2, A-4, A-6	0	0	98-100	90-100	80-100	30-85	16-40	4-18
Berda-----	0-7	Loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0-3	85-100	84-98	75-95	36-65	20-35	7-20
	7-22	Clay loam, sandy clay loam, loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20
	22-47	Clay loam, loam, sandy clay loam	CL, SC-SM, SC, CL-ML	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20
	47-80	Clay loam, loam, fine sandy loam, sandy clay loam	SC-SM, CL, CL-ML, SC	A-4, A-6	0	0	85-100	84-98	75-95	36-65	20-35	7-20
PdoA: Paloduro-----	0-9	Clay loam	CL	A-6	0	0	95-100	90-100	80-98	55-80	30-40	12-20
	9-14	Clay loam, loam, sandy clay loam	SC, CL	A-4, A-6	0	0	95-100	90-100	75-98	45-75	25-40	8-20
	14-27	Clay loam, loam, sandy clay loam	SC, CL	A-4, A-6	0	0	95-100	90-100	75-98	45-75	25-40	8-20
	27-80	Stratified clay loam, loam, stratified sandy clay loam	SC, CL	A-4, A-6	0	0	95-100	90-100	75-98	45-75	25-40	8-20

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
PdoB: Paloduro-----	0-10	Clay loam	SC, CL	A-4, A-6	0	0	95-100	90-100	80-98	45-75	25-38	9-20
	10-20	Loam, clay loam, sandy clay loam	SC, CL	A-4, A-6	0	0	95-100	90-100	75-98	45-75	25-40	8-20
	20-35	Loam, clay loam, sandy clay loam	SC, CL	A-4, A-6	0	0	95-100	90-100	75-98	45-75	25-40	8-20
	35-44	Loam	SC, CL	A-4, A-6	0	0	95-100	90-100	80-98	45-75	25-38	9-20
	44-80	Loam, clay loam, sandy clay loam	SC, CL	A-4, A-6	0	0	95-100	90-100	75-98	45-75	25-40	8-20
PdoC2: Paloduro-----	0-10	Clay loam	CL	A-6	0	0	95-100	90-100	80-98	55-80	30-40	12-20
	10-25	Loam, clay loam, sandy clay loam	SC, CL	A-4, A-6	0	0	95-100	90-100	75-98	45-75	25-40	8-20
	25-49	Loam, clay loam, sandy clay loam	SC, CL	A-4, A-6	0	0	95-100	90-100	75-98	45-75	25-40	8-20
	49-80	Fine sandy loam, loam, clay loam, sandy clay loam	SC, CL	A-4, A-6	0	0	95-100	90-100	75-98	45-75	25-40	8-20
PIT: Pits-----	0-60	Variable	---	---	---	---	---	---	---	---	---	---
PlmB: Plemons-----	0-8	Loam	CL	A-4, A-6	0	0	98-100	96-100	85-100	51-80	25-34	8-15
	8-21	Clay loam, sandy clay loam	CL	A-6, A-7-6	0	0	98-100	96-100	85-100	60-90	30-45	15-27
	21-46	Clay loam, sandy clay loam	CL	A-6, A-7-6	0	0	98-100	96-100	85-100	60-90	30-45	15-27
	46-80	Clay loam, sandy clay loam	CL	A-6, A-7-6	0	0	93-100	90-100	85-100	60-90	30-45	15-27

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
PlmC: Plemons-----	0-8	Loam	CL	A-4, A-6	0	0	98-100	96-100	85-100	51-80	25-34	8-15
	8-18	Sandy clay loam, clay loam	CL	A-6, A-7-6	0	0	98-100	96-100	85-100	60-90	30-45	15-27
	18-42	Clay loam, sandy clay loam	CL	A-6, A-7-6	0	0	93-100	90-100	85-100	60-90	30-45	15-27
	42-60	Clay loam, sandy clay loam	CL	A-6, A-7-6	0	0	93-100	90-100	85-100	60-90	30-45	15-27
	60-80	Clay loam, sandy clay loam	CL	A-6, A-7-6	0	0	93-100	90-100	85-100	60-90	30-45	15-27
PlmD: Plemons-----	0-8	Loam	CL	A-4, A-6	0	0	98-100	96-100	85-100	51-80	25-34	8-15
	8-19	Sandy clay loam, clay loam	CL	A-6, A-7-6	0	0	98-100	96-100	85-100	60-90	30-45	15-27
	19-37	Clay loam, sandy clay loam	CL	A-6, A-7-6	0	0	93-100	90-100	85-100	60-90	30-45	15-27
	37-60	Clay loam, sandy clay loam	CL	A-6, A-7-6	0	0	93-100	90-100	85-100	60-90	30-45	15-27
	60-80	Clay loam, sandy clay loam	CL	A-6, A-7-6	0	0	93-100	90-100	85-100	60-90	30-45	15-27
QnWC3: Quinlan-----	0-13	Loam	SC, ML, CL- ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	36-98	0-43	NP-20
	13-18	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
Woodward-----	0-3	Loam	CL, ML, CL-ML	A-4	0	0	100	100	96-100	65-97	22-31	2-10
	3-30	Loam, silt loam, very fine sandy loam	ML, CL-ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	30-35	Weathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
QnWD: Quinlan-----	0-6	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	51-97	22-35	6-14
	6-15	Loam, silt loam, clay loam	SC, ML, CL- ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	36-98	0-43	NP-20
	15-24	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
Woodward-----	0-8	Silt loam	ML, CL-ML, CL	A-4	0	0	100	100	96-100	65-97	22-31	2-10
	8-18	Loam, silt loam, very fine sandy loam	ML, CL-ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	18-25	Loam, silt loam, very fine sandy loam	CL, CL-ML, ML	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	25-29	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
QnWE: Quinlan-----	0-6	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	51-97	22-35	6-14
	6-14	Loam, silt loam, clay loam	ML, CL-ML, CL, SC	A-4, A-6, A-7	0	0	100	100	90-100	36-98	0-43	NP-20
	14-18	Loam, silt loam, clay loam	SC, ML, CL- ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	36-98	0-43	NP-20
	18-22	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
Woodward-----	0-4	Very fine sandy loam	ML, CL, CL-ML	A-4	0	0	100	100	96-100	65-97	22-31	2-10
	4-16	Loam, silt loam, very fine sandy loam	ML, CL-ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	16-22	Loam, silt loam, very fine sandy loam	CL, ML, CL-ML	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	22-26	Weathered bedrock	---	---	---	---	---	---	---	---	---	---



Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
QRWG: Quinlan-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	51-97	22-35	6-14
	8-13	Loam, silt loam, clay loam	CL-ML, ML, SC, CL	A-4, A-6, A-7	0	0	100	100	90-100	36-98	0-43	NP-20
	13-18	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-60	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Woodward-----	0-6	Loam	CL, CL-ML, ML	A-4	0	0	100	100	96-100	65-97	22-31	2-10
	6-14	Loam, silt loam, very fine sandy loam	CL-ML, ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	14-22	Loam, silt loam, very fine sandy loam	ML, CL-ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	22-25	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
QRYG: Quinlan-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0	100	100	90-100	51-97	22-35	6-14
	8-14	Loam, silt loam, clay loam	ML, CL, SC, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	36-98	0-43	NP-20
	14-18	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-60	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---



Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
QWDE: Deepwood-----	0-12	Very fine sandy loam	ML, CL-ML	A-4	0	0	100	100	94-100	51-75	15-28	NP-7
	12-28	Very fine sandy loam, silt loam, loam	CL-ML, ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	28-80	Very fine sandy loam, silt loam, loam	ML, CL, CL-ML	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	80-92	Very fine sandy loam, silt loam, loam	CL, CL-ML, ML	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	92-106	Very fine sandy loam, silt loam, loam	CL, CL-ML, ML	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
QWRC: Quinlan-----	0-6	Very fine sandy loam	ML, CL-ML	A-4	0	0	100	100	94-100	51-75	14-28	NP-7
	6-14	Very fine sandy loam, silt loam, clay loam, loam	CL-ML, SC, ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	36-98	0-43	NP-20
	14-18	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
Woodward-----	0-6	Very fine sandy loam	ML, CL-ML	A-4	0	0	100	100	94-100	51-75	15-28	NP-7
	6-18	Very fine sandy loam, silt loam, loam	ML, CL-ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	18-28	Very fine sandy loam, silt loam, loam	ML, CL-ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	28-38	Very fine sandy loam, silt loam, loam	ML, CL-ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	38-42	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-60	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
RoCH: Rock outcrop----	0-60	Gypsiferous material	---	---	---	---	---	---	---	---	---	---
Cottonwood-----	0-9	Loam	CL, CL-ML	A-4, A-6	0	0	98-100	95-100	80-100	55-85	20-35	4-15
	9-13	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
RssA: Rosston-----	0-13	Clay	CH	A-7-6	0	0	100	100	95-100	85-98	60-76	40-50
	13-31	Clay, silty clay	CH	A-7-6	0	0	100	100	95-100	85-98	60-76	40-50
	31-51	Clay, silty clay	CH	A-7-6	0	0	100	98-100	90-100	80-95	60-76	40-50
	51-80	Clay, silty clay	CH	A-7-6	0	0	100	98-100	90-100	80-95	60-76	40-50
SAL: Salt flats-----	0-14	Fine sand	SM, SP-SM	A-2, A-3	0	0	100	98-100	82-98	3-25	0-14	NP
	14-40	Stratified sand to clay loam	SM, ML, CL, SP-SM	A-2, A-4, A-6, A-7	0	0	100	98-100	80-100	5-90	0-43	NP-18
	40-80	Stratified sand to fine sandy loam	SM	A-2, A-3	0	0	100	98-100	82-98	5-25	0-14	NP
SelA: Selman-----	0-15	Silt loam	ML, CL-ML, CL	A-4, A-6	0	0	100	100	96-100	80-97	22-37	2-13
	15-25	Silt loam, loam, very fine sandy loam	ML, CL, CL-ML	A-4, A-6	0	0	100	100	94-100	65-97	14-37	NP-14
	25-38	Silt loam, clay loam, silty clay loam	CL	A-4, A-6, A-7	0	0	100	100	96-100	80-98	30-42	8-20
	38-55	Silt loam, clay loam, silty clay loam	CL	A-4, A-6, A-7	0	0	100	100	96-100	80-98	30-42	8-20
	55-80	Loam, silt loam	ML, CL-ML, CL	A-4, A-6	0	0	100	100	96-100	70-97	22-37	2-14

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
SelB: Selman-----	0-5	Silt loam	ML, CL-ML, CL	A-4, A-6	0	0	100	100	96-100	80-97	22-37	2-13
	5-16	Loam, silt loam, very fine sandy loam	ML, CL-ML, CL	A-4, A-6	0	0	100	100	94-100	65-97	14-37	NP-14
	16-51	Loam, clay loam, silt loam, silty clay loam	CL	A-4, A-6, A-7	0	0	100	100	96-100	80-98	30-42	8-20
	51-61	Silt loam, clay loam, silty clay loam	CL	A-4, A-6, A-7	0	0	100	100	96-100	80-98	30-42	8-20
	61-80	Loam, silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	96-100	70-97	22-37	2-14
SelC: Selman-----	0-8	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	96-100	80-97	22-37	2-13
	8-14	Silt loam, loam, very fine sandy loam	ML, CL-ML, CL	A-4, A-6	0	0	100	100	94-100	65-97	14-37	NP-14
	14-27	Silt loam, clay loam, silty clay loam	CL	A-4, A-6, A-7	0	0	100	100	96-100	80-98	30-42	8-20
	27-56	Silty clay loam, clay loam, silt loam	CL	A-4, A-6, A-7	0	0	100	100	96-100	80-98	30-42	8-20
	56-80	Silt loam, loam	CL-ML, ML, CL	A-4, A-6	0	0	100	100	96-100	70-97	22-37	2-14
SelC2: Selman-----	0-6	Silt loam	ML, CL-ML, CL	A-4, A-6	0	0	100	100	96-100	80-97	22-37	2-13
	6-18	Silt loam, loam, very fine sandy loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	94-100	65-97	14-37	NP-14
	18-31	Silty clay loam, clay loam, silt loam	CL	A-4, A-6, A-7	0	0	100	100	96-100	80-98	30-42	8-20
	31-54	Silty clay loam, clay loam, silt loam	CL	A-4, A-6, A-7	0	0	100	100	96-100	80-98	30-42	8-20
	54-80	Loam, silt loam	ML, CL, CL-ML	A-4, A-6	0	0	100	100	96-100	70-97	22-37	2-14

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
SelD: Selman-----	0-9	Silt loam	CL, ML, CL-ML	A-4, A-6	0	0	100	100	96-100	80-97	22-37	2-13
	9-16	Silt loam, loam, very fine sandy loam	ML, CL-ML, CL	A-4, A-6	0	0	100	100	94-100	65-97	14-37	NP-14
	16-61	Silty clay loam, clay loam, silt loam	CL	A-4, A-6, A-7	0	0	100	100	96-100	80-98	30-42	8-20
	61-80	Silt loam, loam	ML, CL-ML, CL	A-4, A-6	0	0	100	100	96-100	70-97	22-37	2-14
SelD2: Selman-----	0-7	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	96-100	80-97	22-37	2-13
	7-24	Silty clay loam, clay loam, silt loam	CL	A-4, A-6, A-7	0	0	100	100	96-100	80-98	30-42	8-20
	24-43	Silty clay loam, clay loam, silt loam	CL	A-4, A-6, A-7	0	0	100	100	96-100	80-98	30-42	8-20
	43-80	Silt loam, loam	CL-ML, ML, CL	A-4, A-6	0	0	100	100	96-100	70-97	22-37	2-14
SprA: Spr-----	0-12	Loam	CL	A-6	0	0	100	98-100	85-100	55-85	30-37	11-16
	12-21	Sandy clay loam, clay loam, loam	CL	A-6, A-7-6	0	0	100	98-100	80-100	55-85	28-45	11-25
	21-39	Sandy clay loam, clay loam, loam	CL	A-6, A-7-6	0	0	100	98-100	80-100	55-85	28-45	11-25
	39-80	Sandy clay loam, clay loam, loam	CL	A-6, A-7-6	0	0	100	98-100	80-100	55-85	28-45	11-25

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
SpsA: Spur-----	0-18	Loam	CL	A-6	0	0	100	98-100	85-100	55-85	30-37	11-16
	18-35	Clay loam, loam, sandy clay loam	CL	A-6, A-7-6	0	0	100	98-100	80-100	55-85	28-45	11-25
	35-57	Clay loam, loam, sandy clay loam	CL	A-6, A-7-6	0	0	100	98-100	80-100	55-85	28-45	11-25
	57-80	Clay loam, loam, sandy clay loam	CL	A-6, A-7-6	0	0	100	98-100	80-100	55-85	28-45	11-25
StpA: St. Paul-----	0-13	Silt loam	ML, CL-ML, CL	A-4, A-6	0	0	100	100	95-100	65-98	22-35	2-13
	13-22	Silt loam, silty clay loam, clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-98	33-43	12-20
	22-66	Silty clay loam, silt loam, loam, clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-98	33-50	12-26
	66-77	Loam, silt loam, silty clay loam	CL	A-4, A-6, A-7	0	0	100	100	95-100	75-98	27-50	8-26
	77-88	Loam, silt loam, silty clay loam	CL	A-4, A-6	0	0	100	100	95-100	75-98	27-40	8-18
StpB: St. Paul-----	0-13	Silt loam	ML, CL-ML, CL	A-4, A-6	0	0	100	100	95-100	65-98	22-35	2-13
	13-20	Silty clay loam, clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-98	33-43	12-20
	20-31	Silty clay loam, clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-98	33-50	12-26
	31-45	Silty clay loam, loam, silt loam	CL	A-4, A-6, A-7	0	0	100	100	95-100	75-98	27-50	8-26
	45-86	Silt loam, loam, silty clay loam	CL	A-4, A-6	0	0	100	100	95-100	75-98	27-40	8-18

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
StpC: St. Paul-----	0-11	Silt loam	CL, ML, CL-ML	A-4, A-6	0	0	100	100	95-100	65-98	22-35	2-13
	11-20	Silt loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	100	100	95-100	75-98	30-43	8-18
	20-33	Silty clay loam, clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-98	33-43	12-20
	33-51	Silty clay loam, clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-98	33-50	12-26
	51-80	Silt loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	100	100	95-100	75-98	27-50	8-26
StpD: St. Paul-----	0-9	Silt loam	ML, CL-ML, CL	A-4, A-6	0	0	100	100	95-100	65-98	22-35	2-13
	9-22	Silty clay loam, clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-98	33-43	12-20
	22-42	Silty clay loam, clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-98	33-50	12-26
	42-61	Silty clay loam, loam, silt loam	CL	A-4, A-6, A-7	0	0	100	100	95-100	75-98	27-50	8-26
	61-80	Silt loam, loam, silty clay loam	CL	A-4, A-6	0	0	100	100	95-100	75-98	27-40	8-18
TeWE: Teagard-----	0-9	Clay loam	CL	A-6, A-7	0	0	100	100	96-100	80-90	33-50	12-26
	9-18	Silty clay loam, clay, clay loam, silty clay	CL, CH	A-6, A-7	0	0	100	100	96-100	80-99	37-60	15-34
	18-30	Silty clay, clay, clay loam, silty clay loam	CL, CH	A-6, A-7	0	0	100	100	96-100	80-99	37-60	15-34
	30-38	Silty clay loam, clay, silty clay	CL, CH	A-7	0	0	100	100	96-100	90-99	41-60	18-34
	38-40	Weathered bedrock	---	---	---	---	---	---	---	---	---	---



Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
TeWE: Wellsford-----	0-7	Clay loam	CL	A-6, A-7-6	0	0-5	95-100	95-100	90-100	75-95	35-50	15-30
	7-16	Silty clay, clay, clay loam	CL, CH	A-7-6	0	0-5	95-100	95-100	85-100	75-95	45-70	20-40
	16-20	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
TexA: Texroy-----	0-13	Loam	CL	A-4, A-6	0	0	100	100	95-100	60-85	22-30	8-16
	13-24	Loam, sandy clay loam, clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	60-90	25-45	11-25
	24-37	Clay loam, sandy clay loam, loam	CL	A-6, A-7-6	0	0	100	100	95-100	60-90	25-45	11-25
	37-63	Clay loam, sandy clay loam, loam	CL	A-6, A-7-6	0	0	100	100	95-100	60-90	25-45	11-25
	63-80	Clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	60-90	25-45	11-25
TexB: Texroy-----	0-11	Loam	CL	A-4, A-6	0	0	100	100	95-100	60-85	22-30	8-16
	11-23	Loam, sandy clay loam, clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	60-90	25-45	11-25
	23-42	Clay loam, sandy clay loam, loam	CL	A-6, A-7-6	0	0	100	100	95-100	60-90	25-45	11-25
	42-64	Clay loam, sandy clay loam, loam	CL	A-6, A-7-6	0	0	100	100	95-100	60-90	25-45	11-25
	64-80	Clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	60-90	25-45	11-25
TexC: Texroy-----	0-12	Loam	CL	A-4, A-6	0	0	100	100	95-100	60-85	22-30	8-16
	12-20	Loam, sandy clay loam, clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	60-90	25-45	11-25
	20-35	Clay loam, sandy clay loam, loam	CL	A-6, A-7-6	0	0	100	100	95-100	60-90	25-45	11-25
	35-51	Clay loam, sandy clay loam, loam	CL	A-6, A-7-6	0	0	100	100	95-100	60-90	25-45	11-25
	51-80	Clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	60-90	25-45	11-25

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
TipA: Tipton-----	0-10	Loam	ML, CL-ML	A-4	0	0	100	100	95-100	65-85	22-29	2-7
	10-21	Clay loam, loam	CL	A-4, A-6	0	0	100	100	95-100	65-90	30-40	9-18
	21-45	Clay loam, loam	CL	A-4, A-6	0	0	100	100	95-100	65-90	30-40	9-18
	45-62	Loam, clay loam	CL	A-4, A-6	0	0	100	100	95-100	65-90	30-40	9-18
	62-80	Loam, clay loam	CL	A-4, A-6	0	0	100	100	95-100	65-90	30-40	9-18
TipB: Tipton-----	0-8	Loam	ML, CL-ML	A-4	0	0	100	100	95-100	65-85	22-29	2-7
	8-26	Loam, clay loam	CL	A-4, A-6	0	0	100	100	95-100	65-90	30-40	9-18
	26-38	Clay loam, loam	CL	A-4, A-6	0	0	100	100	95-100	65-90	30-40	9-18
	38-55	Clay loam, loam	CL	A-4, A-6	0	0	100	100	95-100	65-90	30-40	9-18
	55-80	Clay loam, loam	CL	A-4, A-6	0	0	100	100	95-100	65-90	30-40	9-18
TipC: Tipton-----	0-23	Loam	ML, CL-ML	A-4	0	0	100	100	95-100	65-85	22-29	2-7
	23-35	Clay loam, loam	CL	A-4, A-6	0	0	100	100	95-100	65-90	30-40	9-18
	35-49	Clay loam, loam	CL	A-4, A-6	0	0	100	100	95-100	65-90	30-40	9-18
	49-72	Clay loam, loam	CL	A-4, A-6	0	0	100	100	95-100	65-90	30-40	9-18
	72-80	Loam, clay loam	CL	A-4, A-6	0	0	100	100	95-100	65-90	30-40	9-18
TipD: Tipton-----	0-17	Loam	CL-ML, ML	A-4	0	0	100	100	95-100	65-85	22-29	2-7
	17-22	Loam	CL-ML, ML	A-4	0	0	100	100	95-100	65-85	22-29	2-7
	22-50	Loam, clay loam	CL	A-4, A-6	0	0	100	100	95-100	65-90	30-40	9-18
	50-70	Fine sandy loam, clay loam, loam	CL	A-4, A-6	0	0	100	100	95-100	65-90	30-40	9-18
	70-80	Fine sandy loam, clay loam, loam	CL	A-4, A-6	0	0	100	100	95-100	65-90	30-40	9-18
TRQC: Talpa-----	0-12	Loam	CL	A-6, A-7	0	0-5	95-100	90-100	85-98	60-90	30-45	11-25
	12-14	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-14	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Quinlan-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0	100	100	90-100	51-97	22-35	6-14
	8-14	Loam, silt loam, clay loam	SC, ML, CL, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	36-98	0-43	NP-20
	14-20	Weathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
TvlC: Tivoli-----	0-7	Fine sand	SM	A-2	0	0	100	98-100	90-100	3-35	0-14	NP
	7-80	Fine sand, sand	SM, SP-SM	A-2, A-3	0	0	100	98-100	80-100	3-25	0-0	NP
TvlE: Tivoli-----	0-13	Fine sand	SM	A-2	0	0	100	98-100	90-100	3-35	0-14	NP
	13-20	Loamy sand, sand, fine sand	SP-SM, SM	A-2, A-3	0	0	100	98-100	80-100	3-25	0-0	NP
	20-80	Loamy sand, fine sand, sand	SP-SM, SM	A-2, A-3	0	0	100	98-100	80-100	3-25	0-0	NP
TvlG: Tivoli-----	0-8	Fine sand	SM	A-2	0	0	100	98-100	90-100	3-35	0-14	NP
	8-18	Loamy fine sand, fine sand, sand	SP-SM, SM	A-2, A-3	0	0	100	98-100	80-100	3-25	0-0	NP
	18-40	Loamy fine sand, fine sand, sand	SP-SM, SM	A-2, A-3	0	0	100	98-100	80-100	3-25	0-0	NP
	40-80	Loamy fine sand, fine sand, sand	SP-SM, SM	A-2, A-3	0	0	100	98-100	80-100	3-25	0-0	NP
VerB: Vernon-----	0-5	Clay loam	CL	A-6, A-7-6	0	0	95-100	90-100	90-100	70-95	35-50	17-30
	5-11	Clay loam, clay, silty clay	CL, CH	A-6, A-7-6	0	0	95-100	90-100	90-100	80-98	38-60	20-40
	11-22	Clay, silty clay	CL, CH	A-7-6, A-6	0	0	95-100	90-100	90-100	80-98	38-60	20-40
	22-34	Clay, silty clay	CL, CH	A-6, A-7-6	0	0	95-100	90-100	90-100	80-98	38-60	20-40
	34-39	Bedrock	---	---	---	---	---	---	---	---	---	---
VerC: Vernon-----	0-6	Clay loam	CL	A-6, A-7-6	0	0	95-100	90-100	90-100	70-95	35-50	17-30
	6-35	Gravelly clay, clay, silty clay	CL, CH	A-6, A-7-6	0	0	95-100	90-100	90-100	80-98	38-60	20-40
	35-39	Bedrock	---	---	---	---	---	---	---	---	---	---



Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
WodA: Woods-----	0-16	Clay loam	CL	A-6, A-7	0	0	100	100	96-100	80-98	33-50	12-26
	16-26	Clay, silty clay, silty clay loam	CL, CH	A-6, A-7	0	0	100	100	98-100	90-99	37-60	15-34
	26-42	Clay, silty clay, silty clay loam, clay loam	CL, CH	A-6, A-7	0	0	100	100	96-100	80-99	37-60	15-34
	42-62	Clay, silty clay, silty clay loam, clay loam	CL, CH	A-6, A-7	0	0	100	100	96-100	80-99	37-60	15-34
	62-80	Clay loam, clay, silty clay loam, silty clay	CL, CH	A-4, A-6, A-7	0	0	100	100	96-100	65-99	30-60	9-34
WodB: Woods-----	0-11	Clay loam	CL	A-6, A-7	0	0	100	100	96-100	80-98	33-50	12-26
	11-26	Clay, silty clay, silty clay loam, clay loam	CH, CL	A-6, A-7	0	0	100	100	98-100	90-99	37-60	15-34
	26-41	Clay, silty clay, silty clay loam, clay loam	CH, CL	A-6, A-7	0	0	100	100	96-100	80-99	37-60	15-34
	41-60	Clay loam, clay, silty clay loam, silty clay	CH, CL	A-6, A-7	0	0	100	100	96-100	80-99	37-60	15-34
	60-80	Clay loam, clay, silty clay loam, silty clay	CH, CL	A-4, A-6, A-7	0	0	100	100	96-100	65-99	30-60	9-34

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
WodC: Woods-----	0-10	Clay loam	CL	A-6, A-7	0	0	100	100	96-100	80-98	33-50	12-26
	10-13	Clay loam, silty clay loam	CL	A-6, A-7	0	0	100	100	96-100	80-98	33-50	12-26
	13-51	Clay, silty clay, silty clay loam	CH, CL	A-6, A-7	0	0	100	100	98-100	90-99	37-60	15-34
	51-69	Clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7	0	0	100	100	96-100	80-99	37-60	15-34
	69-80	Clay loam, stratified silt loam to clay	CH, CL	A-4, A-6, A-7	0	0	100	100	96-100	65-99	30-60	9-34
WQHE: Westola-----	0-11	Loam	ML, CL-ML, CL	A-4	0	0	100	100	95-100	65-85	15-31	NP-10
	11-18	Loam, fine sandy loam, very fine sandy loam	SM, SC, CL, ML	A-4	0	0	100	95-100	90-100	36-85	15-30	NP-10
	18-28	Loam, stratified loamy fine sand to loam	SM, CL, ML, SC	A-2, A-4	0	0	100	95-100	90-100	15-85	15-30	NP-10
	28-34	Fine sandy loam, stratified loamy fine sand to loam	CL, ML, SM, SC	A-2, A-4	0	0	100	95-100	90-100	15-85	15-30	NP-10
	34-80	Stratified loamy fine sand to loam	CL, ML, SC, SM	A-2, A-4	0	0	100	95-100	90-100	15-85	15-30	NP-10
Quinlan-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0	100	100	90-100	51-97	22-35	6-14
	8-15	Loam, silt loam, clay loam	SC, ML, CL- ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	36-98	0-43	NP-20
	15-18	Weathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
WQHE: Hardeman-----	0-9	Loam	CL-ML, SC-SM, SM, ML	A-4	0	0	100	98-100	70-96	40-70	17-27	2-9
	9-18	Loam, very fine sandy loam, fine sandy loam	ML, SC-SM, SM, CL-ML	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
	18-35	Fine sandy loam, very fine sandy loam, loam	SM, SC-SM, ML, CL-ML	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
	35-47	Fine sandy loam, very fine sandy loam, loam	SM, SC-SM, CL-ML, ML	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
	47-80	Fine sandy loam, very fine sandy loam, loam	SC-SM, CL-ML, ML, SM	A-2-4, A-4	0	0	100	98-100	70-96	30-60	17-27	2-9
WQnB: Woodward-----	0-8	Loam	ML, CL, CL-ML	A-4	0	0	100	100	96-100	65-97	22-31	2-10
	8-19	Loam, silt loam, very fine sandy loam	ML, CL-ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	19-25	Very fine sandy loam, silt loam, loam	CL, ML, CL-ML	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	25-30	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
Quinlan-----	0-6	Loam	CL-ML, CL	A-4, A-6	0	0	100	100	90-100	51-97	22-35	6-14
	6-18	Very fine sandy loam, silt loam, clay loam, loam	CL, SC, CL- ML, ML	A-4, A-6, A-7	0	0	100	100	90-100	36-98	0-43	NP-20
	18-22	Weathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
WQnC: Woodward-----	0-7	Loam	ML, CL-ML, CL	A-4	0	0	100	100	96-100	65-97	22-31	2-10
	7-30	Loam, silt loam, very fine sandy loam	ML, CL-ML, CL	A-4	0	0	100	100	94-100	51-97	15-31	NP-10
	30-35	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
Quinlan-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0	100	100	90-100	51-97	22-35	6-14
	8-13	Loam, silt loam, clay loam	SC, CL, CL- ML, ML	A-4, A-6, A-7	0	0	100	100	90-100	36-98	0-43	NP-20
	13-18	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
WslA: Westola-----	0-8	Fine sandy loam	CL-ML, SM, SC-SM, ML	A-4	0	0	100	95-100	90-100	36-60	15-26	NP-7
	8-16	Fine sandy loam, loam, very fine sandy loam	CL, ML, SC, SM	A-4	0	0	100	95-100	90-100	36-85	15-30	NP-10
	16-27	Stratified loamy fine sand to fine sandy loam	CL, ML, SC, SM	A-2, A-4	0	0	100	95-100	90-100	15-85	15-30	NP-10
	27-33	Clay loam, loam, very fine sandy loam, fine sandy loam	SM, SC, ML, CL	A-4	0	0	100	95-100	90-100	36-85	15-30	NP-10
	33-80	Stratified fine sandy loam to loamy fine sand	SM, SC, CL, ML	A-2, A-4	0	0	100	95-100	90-100	15-85	15-30	NP-10



Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
WstA: Westola-----	0-10	Fine sandy loam	ML, CL-ML, SM, SC-SM	A-4	0	0	100	95-100	90-100	36-60	15-26	NP-7
	10-25	Very fine sandy loam, loam, fine sandy loam	SM, SC, CL, ML	A-4	0	0	100	95-100	90-100	36-85	15-30	NP-10
	25-43	Very fine sandy loam, loam, fine sandy loam	ML, CL, SC, SM	A-4	0	0	100	95-100	90-100	36-85	15-30	NP-10
	43-90	Stratified very fine sandy loam to clay loam	CL, ML, SC, SM	A-4, A-2	0	0	100	95-100	90-100	15-85	15-30	NP-10
	90-99	Stratified loamy fine sand to very fine sandy loam	SM, SC, ML, CL	A-2, A-4	0	0	100	95-100	90-100	15-85	15-30	NP-10
YmrA: Yomont-----	0-12	Loam	CL-ML, ML	A-4	0	0	100	98-100	95-100	60-90	16-30	NP-7
	12-24	Silt loam, loam, very fine sandy loam	CL-ML, ML	A-4	0	0	100	98-100	85-100	55-85	16-30	NP-7
	24-31	Silt loam, loam, very fine sandy loam	CL-ML, ML	A-4	0	0	100	98-100	85-100	55-85	16-30	NP-7
	31-39	Silt loam, loam, very fine sandy loam	CL-ML, ML	A-4	0	0	100	98-100	85-100	55-85	16-30	NP-7
	39-80	Very fine sandy loam, loam, silt loam	CL-ML, ML	A-4	0	0	100	98-100	85-100	55-85	16-30	NP-7

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
YmtA: Yomont-----	0-7	Loam	ML, CL-ML	A-4	0	0	100	98-100	95-100	60-90	16-30	NP-7
	7-16	Silt loam, loam, very fine sandy loam	ML, CL-ML	A-4	0	0	100	98-100	85-100	55-85	16-30	NP-7
	16-21	Loam, very fine sandy loam, silt loam	CL-ML, ML	A-4	0	0	100	98-100	85-100	55-85	16-30	NP-7
	21-60	Silt loam, loam, very fine sandy loam	CL-ML, ML	A-4	0	0	100	98-100	85-100	55-85	16-30	NP-7
	60-80	Stratified sand to coarse sand, loam, silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0	100	98-100	85-100	55-85	16-30	NP-7

## Engineering Index Test Data

Table 18, "Engineering Index Test Data of Selected Soils," shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are representative of the series in this survey. The soil samples were tested by the Oklahoma Department of Transportation, Materials Division.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Mechanical analysis—T 88 (AASHTO), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 423 (ASTM); Plasticity index—T 90 (AASHTO), D 424 (ASTM), D 1883 (ASTM); and Shrinkage—T 92 (AASHTO), D 427 (ASTM).

Table 18.--Engineering Index Test Data of Selected Soils

[Dashes indicate that data were not available. RN means report number; HO, horizon; LL, liquid limit; PI, plasticity index; and NP, nonplastic]

Soil name and sample number*	Parent material	RN	Depth	HO	Shrinkage		Percentage passing sieve--			Percentage smaller than			LL	PI	AASHTO Classification
					limit	ratio	No. 10	No. 40	No. 200	0.05 mm	0.005 mm	0.002 mm			
			In										Pct		
Abbie: S93OK-059-007	Alluvium	4771	0-6	Ap	14	1.87	100	98	77	68	28	18	31	14	A-6
		4773	12-24	Bt1&2	14	1.86	100	98	71	62	28	26	36	20	A-6
Deepwood: S94OK-059-011	Alluvium and colluvium	5419	0-12	A	---	----	100	99	76	52	15	13	NP	NP	A-4
		5421	12-99	Bw&Bk	---	----	100	99	75	50	18	15	NP	NP	A-4
Devol: S94OK-059-010	Alluvium and eolian sand	5409	0-6	A	---	----	100	98	18	14	9	8	NP	NP	A-2-4
		5410	6-23	Bt	---	----	100	97	18	15	12	11	NP	NP	A-2-4
Lugert: S94OK-059-016	Alluvium	5467	0-11	A	---	----	100	99	85	59	19	17	NP	NP	A-4
		5469	11-36	Bw&Bk	---	----	100	99	83	65	18	14	NP	NP	A-4
St. Paul: S93OK-059-005	Alluvium	4754	0-13	Ap	16	1.77	100	100	95	82	25	22	30	9	A-4
		4756	13-36	Bt	14	1.91	100	100	96	87	36	30	41	24	A-7-6
Westola: S94OK-059-015	Alluvium	5456	0-10	Ap	---	----	100	99	68	48	13	11	NP	NP	A-4
		5458	10-25	BC1&2	---	----	100	98	53	35	11	8	NP	NP	A-4
Yomont: S93OK-059-002	Alluvium	4732	0-7	A	18	1.76	100	99	87	76	30	23	34	11	A-6
		4734	16-29	Ck1	16	1.81	100	100	89	73	24	18	24	4	A-4

\* Locations of pedons are as follows:

Abbie (S93OK-059-007), 1,700 feet south and 1,800 feet west of the northeast corner of sec. 23, T. 28 N., R. 26 W.  
 Deepwood (S94OK-059-011), 650 feet south and 500 feet east of the northwest corner of sec. 33, T. 28 N., R. 23 W.  
 Devol (S94OK-059-010), 1,800 feet north and 500 feet east of the southwest corner of sec. 6, T. 27 N., R. 25 W.  
 Lugert (S94OK-059-016), 200 feet west and 50 feet south of the northeast corner of sec. 21, T. 29 N., R. 23 W.  
 St. Paul (S93OK-059-005), 900 feet west and 1,600 feet south of the northeast corner of sec. 32, T. 29 N., R. 22 W.  
 Westola (S94OK-059-015), 2,600 feet north and 1,600 feet west of the southeast corner of sec. 17, T. 27 N., R. 21 W.  
 Yomont (S93OK-059-002), 2,000 feet east and 1,600 feet south of the northwest corner of sec. 20, T. 26 N., R. 21 W.

## Physical Properties

Table 19, "Physical Properties of the Soils," shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

*Depth* to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

*Sand* as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In the table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

*Silt* as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In the table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

*Clay* as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In the table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

*Moist bulk density* is the weight of soil (oven-dry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at  $1/3$ - or  $1/10$ -bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

*Permeability* ( $K_{sat}$ ) refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity ( $K_{sat}$ ). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

*Available water capacity* refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an

important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

*Linear extensibility* refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at  $\frac{1}{3}$ - or  $\frac{1}{10}$ -bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

*Organic matter* is the plant and animal residue in the soil at various stages of decomposition. In the table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

*Erosion factors* are shown in the table as the K factor ( $K_w$  and  $K_f$ ) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

*Erosion factor  $K_w$*  indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

*Erosion factor  $K_f$*  indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

*Erosion factor T* is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

*Wind Erodibility Groups*—Wind erodibility is directly related to the percentage of dry, nonerodible surface soil aggregates larger than 0.84 millimeter in diameter. From this percentage, the wind erodibility index factor (I) is determined. This factor is an expression of the stability of the soil aggregates, or the extent to which tillage and the abrasion caused by windblown soil particles break them down. Soils are assigned to wind erodibility groups (WEG) having similar percentages of dry soil aggregates larger than 0.84 millimeter.

*Wind erodibility groups* are made up of soils that have similar properties affecting their resistance to soil blowing in cultivated areas. The groups indicate the susceptibility to soil blowing. Soils are grouped according to the following distinctions:

WEG 1.—Very fine sand, fine sand, sand, and coarse sand.

WEG 2.—Loamy very fine sand, loamy fine sand, loamy sand, loamy coarse sand, ash, and sapric organic soil material.

WEG 3.—Very fine sandy loam, fine sandy loam, sandy loam, and coarse sandy loam.

WEG 4.—Clay, silty clay, and noncalcareous clay loam and silty clay loam with more than 35 percent clay.

WEG 4L.—Calcareous loam, silt loam, clay loam, and silty clay loam characterized by a strongly or violently effervescent reaction to cold dilute (1N) HCl.

WEG 5.—Noncalcareous loam and silt loam with less than 20 percent clay and sandy clay loam, sandy clay, and hemic organic soil material.

WEG 6.—Noncalcareous loam and silt loam with more than 20 percent clay and noncalcareous clay loam with less than 35 percent clay.

WEG 7.—Silt, noncalcareous silty clay loam with less than 35 percent clay, and fibric organic soil material.

WEG 8.—Soils that are not susceptible to soil blowing because of rock fragments on the surface or because of surface wetness.

*Wind erodibility index* is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Additional information about wind erodibility groups and *K*, *K<sub>f</sub>*, *T*, and *I* factors can be obtained from local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Table 19.--Physical Properties of the Soils

[Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated]

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
AbbA: Abbie-----	0-12	23-53	27-50	10-26	1.30-1.55	0.6-2	0.14-0.20	0.0-2.9	1.0-3.0	.37	.37	4	5	56
	12-23	20-53	15-53	20-35	1.40-1.70	0.2-0.6	0.14-0.20	0.0-2.9	0.5-1.0	.32	.32			
	23-42	22-80	0-53	18-35	1.40-1.70	0.2-0.6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
	42-80	22-80	0-53	5-30	1.40-1.70	0.6-6	0.08-0.20	0.0-2.9	0.0-0.5	.28	.32			
AbbB: Abbie-----	0-12	23-53	27-50	10-26	1.30-1.55	0.6-2	0.14-0.20	0.0-2.9	1.0-3.0	.37	.37	4	5	56
	12-24	20-53	15-53	20-35	1.40-1.70	0.2-0.6	0.14-0.20	0.0-2.9	0.5-1.0	.32	.32			
	24-44	22-80	0-53	18-35	1.40-1.70	0.2-0.6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
	44-49	23-53	27-50	7-30	1.40-1.70	0.6-6	0.08-0.20	0.0-2.9	0.0-0.5	.28	.32			
	49-91	20-45	15-53	27-35	1.40-1.70	0.2-0.6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
AbbB2: Abbie-----	0-7	23-53	27-50	10-26	1.30-1.55	0.6-2	0.14-0.20	0.0-2.9	1.0-3.0	.37	.37	4	5	56
	7-17	20-53	15-53	20-35	1.40-1.70	0.2-0.6	0.14-0.20	0.0-2.9	0.5-1.0	.32	.32			
	17-32	22-80	0-53	18-35	1.40-1.70	0.2-0.6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
	32-42	22-80	0-53	5-30	1.40-1.70	0.6-6	0.08-0.20	0.0-2.9	0.0-0.5	.28	.32			
	42-80	22-80	0-53	5-30	1.40-1.70	0.6-6	0.08-0.20	0.0-2.9	0.0-0.5	.28	.32			
AbbC: Abbie-----	0-14	23-53	27-50	10-26	1.30-1.55	0.6-2	0.14-0.20	0.0-2.9	1.0-3.0	.37	.37	4	5	56
	14-26	22-80	15-53	20-35	1.40-1.70	0.2-0.6	0.14-0.20	0.0-2.9	0.5-1.0	.32	.32			
	26-38	22-80	15-53	20-35	1.40-1.70	0.2-0.6	0.14-0.20	0.0-2.9	0.5-1.0	.32	.32			
	38-56	22-80	15-53	18-35	1.40-1.70	0.2-0.6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
	56-80	22-80	0-53	5-30	1.40-1.70	0.6-6	0.08-0.20	0.0-2.9	0.0-0.5	.28	.32			
AbbC2: Abbie-----	0-12	23-53	27-50	10-26	1.30-1.55	0.6-2	0.14-0.20	0.0-2.9	1.0-3.0	.37	.37	4	5	56
	12-23	20-53	15-53	20-35	1.40-1.70	0.2-0.6	0.14-0.20	0.0-2.9	0.5-1.0	.32	.32			
	23-37	20-53	15-53	20-35	1.40-1.70	0.2-0.6	0.14-0.20	0.0-2.9	0.5-1.0	.32	.32			
	37-51	22-80	0-53	18-35	1.40-1.70	0.2-0.6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
	51-80	22-80	0-53	5-30	1.40-1.70	0.6-6	0.08-0.20	0.0-2.9	0.0-0.5	.28	.32			
AbsB: Abilene-----	0-9	0-32	50-82	20-27	1.30-1.65	0.6-2	0.15-0.20	3.0-5.9	1.0-3.0	.37	.37	5	6	48
	9-18	0-45	15-73	20-35	1.30-1.65	0.6-2	0.15-0.20	3.0-5.9	1.0-3.0	.37	.37			
	18-26	0-45	0-60	35-45	1.30-1.60	0.2-0.6	0.14-0.18	3.0-5.9	1.0-2.0	.28	.28			
	26-57	0-45	0-60	35-45	1.40-1.60	0.2-0.6	0.12-0.15	3.0-5.9	0.1-1.0	.32	.32			
	57-80	0-45	0-60	35-45	1.30-1.60	0.2-0.6	0.14-0.18	3.0-5.9	1.0-2.0	.28	.28			



Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
AclA:														
Abbie-----	0-13	20-45	15-53	27-30	1.30-1.60	0.6-2	0.14-0.20	0.0-2.9	1.0-3.0	.32	.32	4	6	48
	13-24	20-53	15-53	20-35	1.40-1.70	0.2-0.6	0.14-0.20	0.0-2.9	0.5-1.0	.32	.32			
	24-61	22-80	0-53	18-35	1.40-1.70	0.2-0.6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
	61-67	20-45	15-53	27-35	1.40-1.70	0.6-6	0.08-0.20	0.0-2.9	0.0-0.5	.28	.32			
	67-80	45-80	0-27	20-30	1.40-1.70	0.6-6	0.08-0.20	0.0-2.9	0.0-0.5	.28	.32			
AflB:														
Abbie-----	0-7	43-85	0-50	8-18	1.30-1.60	2-6	0.10-0.15	0.0-2.9	1.0-3.0	.24	.24	4	3	86
	7-14	22-80	0-53	7-30	1.40-1.70	0.6-6	0.08-0.20	0.0-2.9	0.0-0.5	.28	.32			
	14-47	22-80	0-53	7-35	1.40-1.70	0.6-6	0.08-0.20	0.0-2.9	0.0-0.5	.28	.32			
	47-80	22-80	0-53	7-30	1.40-1.70	0.6-6	0.08-0.20	0.0-2.9	0.0-0.5	.28	.32			
AflC:														
Abbie-----	0-13	43-85	0-50	8-18	1.30-1.60	2-6	0.10-0.15	0.0-2.9	1.0-3.0	.24	.24	4	3	86
	13-27	20-53	15-53	20-35	1.40-1.70	0.2-0.6	0.14-0.20	0.0-2.9	0.5-1.0	.32	.32			
	27-45	22-80	0-53	18-35	1.40-1.70	0.2-0.6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
	45-57	22-80	0-53	5-30	1.40-1.70	0.6-6	0.08-0.20	0.0-2.9	0.0-0.5	.28	.32			
	57-80	22-80	0-53	5-30	1.40-1.70	0.6-6	0.08-0.20	0.0-2.9	0.0-0.5	.28	.32			
BdaB:														
Berda-----	0-6	23-53	27-50	15-27	1.35-1.50	0.6-2	0.12-0.16	0.0-2.9	0.1-1.0	.28	.28	5	4L	86
	6-19	22-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
	19-39	22-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
	39-80	22-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
BdaC:														
Berda-----	0-8	23-53	27-50	15-27	1.35-1.50	0.6-2	0.12-0.16	0.0-2.9	0.1-1.0	.28	.28	5	4L	86
	8-17	22-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
	17-25	22-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
	25-35	22-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
	35-80	22-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
BdaD:														
Berda-----	0-9	23-53	27-50	15-27	1.35-1.50	0.6-2	0.12-0.16	0.0-2.9	0.1-1.0	.28	.28	5	4L	86
	9-25	22-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
	25-46	22-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
	46-80	22-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
CRVE:														
Cottonwood-----	0-8	23-53	27-50	18-27	1.30-1.50	0.6-2	0.11-0.18	0.0-2.9	0.5-1.0	.32	.32	1	4L	86
	8-12	---	---	---	---	0.2-20	---	---	---	---	---			
Rock outcrop----	0-60	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---	--	1	---

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
CRVE: Vinson-----	0-10	23-53	27-50	15-27	1.30-1.55	0.6-2	0.15-0.22	0.0-2.9	1.0-2.0	.37	.37	3	4L	86
	10-23	0-53	15-82	18-30	1.40-1.70	0.6-2	0.15-0.22	3.0-5.9	0.0-0.5	.37	.37			
	23-34	0-53	15-82	18-30	1.40-1.70	0.6-2	0.15-0.22	3.0-5.9	0.0-0.5	.37	.37			
	34-38	---	---	---	1.85-2.35	0.0015-0.06	---	---	---	---	---			
DAM: Dam-----	0-80	---	---	---	---	0.06-2	0.00-0.00	---	---	---	---	--	---	---
DevE: Devol-----	0-8	70-90	0-30	2-15	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.20	.20	5	2	134
	8-23	43-90	0-50	2-18	1.50-1.70	2-6	0.07-0.15	0.0-2.9	0.0-0.5	.20	.20			
	23-43	43-90	0-50	2-15	1.50-1.70	2-6	0.07-0.15	0.0-2.9	0.0-0.5	.20	.20			
	43-80	70-100	0-30	2-10	1.50-1.70	2-6	0.08-0.12	0.0-2.9	0.0-0.5	.17	.17			
DpwB: Deepwood-----	0-6	33-53	30-50	10-18	1.30-1.60	0.6-2	0.16-0.24	0.0-2.9	0.5-2.0	.37	.37	5	5	56
	6-21	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	21-43	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	43-59	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	59-80	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
DpwC: Deepwood-----	0-10	33-53	30-50	10-18	1.30-1.60	0.6-2	0.16-0.24	0.0-2.9	0.5-2.0	.37	.37	5	5	56
	10-23	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	23-36	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	36-60	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	60-80	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
DpwD: Deepwood-----	0-12	33-53	30-50	10-18	1.30-1.60	0.6-2	0.16-0.24	0.0-2.9	0.5-2.0	.37	.37	5	5	56
	12-29	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	29-51	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	51-80	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
DpwE: Deepwood-----	0-8	33-85	30-50	10-18	1.30-1.60	0.6-2	0.16-0.24	0.0-2.9	0.5-2.0	.37	.37	5	5	56
	8-27	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	27-53	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	53-80	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
DvlB: Devol-----	0-5	43-85	0-50	8-18	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	5-13	43-90	0-50	2-18	1.50-1.70	2-6	0.07-0.15	0.0-2.9	0.0-0.5	.20	.20			
	13-29	43-90	0-50	2-15	1.50-1.70	2-6	0.07-0.15	0.0-2.9	0.0-0.5	.20	.20			
	29-42	43-100	0-50	2-10	1.50-1.70	2-6	0.08-0.12	0.0-2.9	0.0-0.5	.17	.17			
	42-80	70-100	0-50	2-10	1.50-1.70	2-6	0.08-0.12	0.0-2.9	0.0-0.5	.17	.17			
DvlC: Devol-----	0-6	43-85	0-50	8-18	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	6-23	43-90	0-50	2-18	1.50-1.70	2-6	0.07-0.15	0.0-2.9	0.0-0.5	.20	.20			
	23-38	43-90	0-50	2-15	1.50-1.70	2-6	0.07-0.15	0.0-2.9	0.0-0.5	.20	.20			
	38-49	70-100	0-30	2-10	1.50-1.70	2-6	0.08-0.12	0.0-2.9	0.0-0.5	.17	.17			
	49-80	43-90	0-50	2-10	1.50-1.70	2-6	0.08-0.12	0.0-2.9	0.0-0.5	.17	.17			
DvlD: Devol-----	0-6	43-85	0-50	8-18	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	6-16	43-90	0-50	2-18	1.50-1.70	2-6	0.07-0.15	0.0-2.9	0.0-0.5	.20	.20			
	16-25	43-90	0-50	2-15	1.50-1.70	2-6	0.07-0.15	0.0-2.9	0.0-0.5	.20	.20			
	25-43	43-100	0-50	2-10	1.50-1.70	2-6	0.08-0.12	0.0-2.9	0.0-0.5	.17	.17			
	43-80	70-100	0-30	2-10	1.50-1.70	2-6	0.08-0.12	0.0-2.9	0.0-0.5	.17	.17			
EdlC: Eda-----	0-7	70-90	0-30	2-8	1.35-1.50	6-20	0.06-0.11	0.0-2.9	0.5-1.0	.15	.15	5	2	134
	7-15	70-100	0-30	1-8	1.50-1.70	6-20	0.02-0.11	0.0-2.9	0.0-0.5	.15	.15			
	15-23	70-100	0-30	1-8	1.50-1.70	6-20	0.02-0.11	0.0-2.9	0.0-0.5	.15	.15			
	23-80	70-100	0-30	1-8	1.50-1.70	6-20	0.02-0.11	0.0-2.9	0.0-0.5	.15	.15			
EdlE: Eda-----	0-10	70-90	0-30	2-8	1.35-1.50	6-20	0.06-0.11	0.0-2.9	0.5-1.0	.15	.15	5	2	134
	10-19	70-100	0-30	1-8	1.50-1.70	6-20	0.02-0.11	0.0-2.9	0.0-0.5	.15	.15			
	19-28	70-100	0-30	1-8	1.50-1.70	6-20	0.02-0.11	0.0-2.9	0.0-0.5	.15	.15			
	28-45	70-100	0-30	1-8	1.50-1.70	6-20	0.02-0.11	0.0-2.9	0.0-0.5	.15	.15			
	45-104	70-100	0-30	1-8	1.50-1.70	6-20	0.02-0.11	0.0-2.9	0.0-0.5	.15	.15			
FayB: Farry-----	0-13	43-85	0-50	8-18	1.30-1.60	2-6	0.10-0.15	0.0-2.9	1.0-3.0	.20	.24	5	3	86
	13-35	23-80	0-50	18-27	1.40-1.70	0.6-2	0.11-0.20	0.0-2.9	0.5-1.0	.24	.32			
	35-47	23-90	0-50	5-27	1.40-1.70	0.6-6	0.07-0.17	0.0-2.9	0.0-0.5	.24	.32			
	47-80	23-90	0-50	3-20	1.40-1.70	2-20	0.05-0.16	0.0-2.9	0.0-0.5	.20	.32			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
FayC: Farry-----	0-12	---	0-50	8-18	1.30-1.60	2-6	0.10-0.15	0.0-2.9	1.0-3.0	.20	.24	5	3	86
	12-19	23-80	0-50	18-27	1.40-1.70	0.6-2	0.11-0.20	0.0-2.9	0.5-1.0	.24	.32			
	19-28	23-90	0-50	5-27	1.40-1.70	0.6-6	0.07-0.17	0.0-2.9	0.0-0.5	.24	.32			
	28-42	23-90	0-50	5-27	1.40-1.70	0.6-6	0.07-0.17	0.0-2.9	0.0-0.5	.24	.32			
	42-80	23-90	0-50	3-20	1.40-1.70	2-6	0.05-0.16	0.0-2.9	0.0-0.5	.20	.32			
FoFE: Fortyone-----	0-8	43-80	0-50	7-15	1.35-1.60	2-6	0.10-0.14	0.0-2.9	0.5-2.0	.17	.20	4	3	86
	8-16	32-85	0-50	10-18	1.45-1.70	2-6	0.10-0.19	0.0-2.9	0.5-1.0	.17	.20			
	16-24	32-90	0-50	4-15	1.45-1.60	2-20	0.06-0.13	0.0-2.9	0.0-0.5	.10	.17			
	24-34	32-100	0-50	2-10	1.50-1.70	6-20	0.02-0.10	0.0-2.9	0.0-0.5	.10	.17			
	34-80	32-100	0-50	2-10	1.50-1.70	6-20	0.02-0.10	0.0-2.9	0.0-0.5	.10	.17			
Farry-----	0-10	43-80	0-50	8-18	1.30-1.60	2-6	0.10-0.15	0.0-2.9	1.0-3.0	.20	.24	5	3	86
	10-18	23-80	0-50	18-27	1.40-1.70	0.6-2	0.11-0.20	0.0-2.9	0.5-1.0	.24	.32			
	18-25	23-90	0-50	5-27	1.40-1.70	0.6-6	0.07-0.17	0.0-2.9	0.0-0.5	.24	.32			
	25-36	23-90	0-50	3-20	1.40-1.70	2-20	0.05-0.16	0.0-2.9	0.0-0.5	.20	.32			
	36-80	23-90	0-50	3-20	1.40-1.70	2-20	0.05-0.16	0.0-2.9	0.0-0.5	.20	.32			
FrkA: Frankirk-----	0-8	0-32	50-82	18-27	1.45-1.60	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	8-15	0-53	40-73	18-35	1.45-1.60	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.32	.32			
	15-24	0-65	0-65	35-60	1.45-1.60	0.2-0.6	0.15-0.20	3.0-5.9	0.5-2.0	.37	.37			
	24-58	0-65	0-65	35-60	1.45-1.60	0.2-0.6	0.15-0.20	3.0-5.9	0.5-2.0	.37	.37			
	58-80	0-80	0-82	20-30	1.50-1.65	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.37	.37			
FrkB: Frankirk-----	0-7	0-32	50-82	18-27	1.40-1.55	0.6-2	0.14-0.18	3.0-5.9	1.0-3.0	.32	.32	5	6	48
	7-18	0-65	0-65	35-60	1.45-1.60	0.2-0.6	0.15-0.20	3.0-5.9	0.5-2.0	.37	.37			
	18-37	0-80	0-65	20-40	1.50-1.65	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.37	.37			
	37-65	0-80	0-65	20-40	1.50-1.65	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.37	.37			
	65-80	0-80	0-82	20-40	1.50-1.65	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.37	.37			
FtnB: Fortyone-----	0-7	43-85	0-50	7-15	1.35-1.60	2-6	0.10-0.14	0.0-2.9	0.5-2.0	.17	.20	4	3	86
	7-13	32-85	0-50	10-18	1.45-1.70	2-6	0.10-0.19	0.0-2.9	0.5-1.0	.17	.20			
	13-21	32-90	0-50	4-15	1.45-1.60	2-20	0.06-0.13	0.0-2.9	0.0-0.5	.10	.17			
	21-80	43-100	0-50	2-10	1.50-1.70	6-20	0.02-0.10	0.0-2.9	0.0-0.5	.10	.17			
FtnC: Fortyone-----	0-8	43-85	0-50	7-15	1.35-1.60	2-6	0.10-0.14	0.0-2.9	0.5-2.0	.17	.20	4	3	86
	8-30	32-85	0-50	10-18	1.45-1.70	2-6	0.10-0.19	0.0-2.9	0.5-1.0	.17	.20			
	30-48	32-90	0-50	4-15	1.45-1.60	2-20	0.06-0.13	0.0-2.9	0.0-0.5	.10	.17			
	48-80	43-100	0-50	2-10	1.50-1.70	6-20	0.02-0.10	0.0-2.9	0.0-0.5	.10	.17			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
<b>FtnD:</b>														
Fortyone-----	0-6	43-85	0-50	7-15	1.35-1.60	2-6	0.10-0.14	0.0-2.9	0.5-2.0	.17	.20	4	3	86
	6-18	32-85	0-50	10-18	1.45-1.70	2-6	0.10-0.19	0.0-2.9	0.5-1.0	.17	.20			
	18-27	32-85	0-50	10-18	1.45-1.70	2-6	0.10-0.19	0.0-2.9	0.5-1.0	.17	.20			
	27-39	32-90	0-50	4-15	1.45-1.60	2-20	0.06-0.13	0.0-2.9	0.0-0.5	.10	.17			
	39-80	43-100	0-50	2-10	1.50-1.70	6-20	0.02-0.10	0.0-2.9	0.0-0.5	.10	.17			
<b>GcsA:</b>														
Gracemore-----	0-9	43-85	0-50	15-20	1.30-1.55	2-6	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32	5	3	86
	9-16	70-100	0-30	2-10	1.50-1.70	2-20	0.05-0.11	0.0-2.9	0.0-0.5	.17	.17			
	16-25	70-100	0-30	2-10	1.50-1.70	2-20	0.05-0.11	0.0-2.9	0.0-0.5	.17	.17			
	25-36	20-45	15-53	27-30	1.30-1.70	0.6-2	0.14-0.20	0.0-2.9	0.5-2.0	.32	.32			
	36-80	43-85	0-50	2-10	1.50-1.70	2-20	0.05-0.11	0.0-2.9	0.0-0.5	.17	.17			
<b>GdfB:</b>														
Grandfield-----	0-12	43-85	0-50	10-18	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	12-47	45-80	0-27	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	47-56	20-80	0-53	18-35	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	56-68	20-80	0-53	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	68-94	43-85	0-50	10-25	1.50-1.70	2-6	0.11-0.15	0.0-2.9	0.0-0.5	.28	.28			
<b>GdfC:</b>														
Grandfield-----	0-8	43-85	0-50	10-18	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	8-25	45-80	0-27	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	25-43	45-80	0-27	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	43-61	45-80	0-27	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	61-80	43-85	0-50	10-25	1.50-1.70	2-6	0.11-0.15	0.0-2.9	0.0-0.5	.28	.28			
<b>GDGE:</b>														
Grandfield-----	0-8	32-52	27-50	10-18	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.24	.24	5	5	86
	8-16	20-80	0-53	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	16-36	20-80	0-53	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	36-60	20-85	0-53	10-35	1.50-1.70	2-6	0.11-0.15	0.0-2.9	0.0-0.5	.28	.28			
	60-80	43-85	0-50	10-25	1.50-1.70	2-6	0.11-0.15	0.0-2.9	0.0-0.5	.28	.28			
<b>Devol-----</b>	0-13	43-85	0-50	8-18	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	13-29	43-85	0-50	2-15	1.50-1.70	2-6	0.07-0.15	0.0-2.9	0.0-0.5	.20	.20			
	29-38	43-90	0-50	2-10	1.50-1.70	2-6	0.08-0.12	0.0-2.9	0.0-0.5	.17	.17			
	38-45	70-90	0-30	2-10	1.50-1.70	2-6	0.08-0.12	0.0-2.9	0.0-0.5	.17	.17			
	45-80	70-100	0-30	2-15	1.50-1.70	2-6	0.07-0.15	0.0-2.9	0.0-0.5	.20	.20			
<b>Grandmore-----</b>	0-15	43-85	0-50	10-18	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	15-30	45-80	0-27	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.5-1.0	.32	.32			
	30-54	0-80	0-53	20-45	1.35-1.65	0.2-0.6	0.12-0.20	3.0-5.9	0.3-0.7	.32	.32			
	54-70	0-45	0-53	30-45	1.35-1.65	0.2-0.6	0.12-0.20	3.0-5.9	0.0-0.4	.32	.32			
	70-80	43-85	0-50	12-20	1.35-1.65	0.2-0.6	0.12-0.20	3.0-5.9	0.0-0.2	.32	.32			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
<b>GdmB:</b>														
Grandmore-----	0-10	43-85	0-50	10-18	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	10-22	22-80	0-80	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.5-1.0	.32	.32			
	22-34	22-80	0-80	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	34-47	22-80	0-80	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.0-0.4	.32	.32			
	47-80	22-80	0-80	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.0-0.2	.32	.32			
<b>GfsA:</b>														
Gracemore-----	0-8	43-85	0-50	15-20	1.30-1.60	2-6	0.10-0.17	0.0-2.9	0.5-1.0	.32	.32	5	3	86
	8-22	70-100	0-30	2-10	1.50-1.70	2-20	0.03-0.09	0.0-2.9	0.0-0.5	.17	.17			
	22-80	70-100	0-30	2-10	1.50-1.70	2-20	0.03-0.09	0.0-2.9	0.0-0.5	.17	.17			
<b>GmrA:</b>														
Gracemont-----	0-7	43-85	0-50	10-18	1.30-1.60	0.6-6	0.11-0.15	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	7-29	32-85	0-50	10-18	1.45-1.65	0.6-6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
	29-45	20-85	0-53	10-35	1.45-1.70	0.6-6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
	45-80	20-85	0-53	10-35	1.45-1.70	0.6-6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
<b>GmsA:</b>														
Gracemont-----	0-7	43-85	0-50	10-18	1.30-1.60	0.6-6	0.11-0.15	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	7-22	32-85	0-50	10-18	1.45-1.65	0.6-6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
	22-31	20-85	0-53	10-32	1.45-1.70	0.6-6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
	31-62	20-85	0-53	10-35	1.45-1.70	0.6-6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
	62-80	20-100	0-53	5-32	1.45-1.70	0.6-6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
<b>GrmA:</b>														
Gracemore-----	0-13	43-85	0-50	15-20	1.30-1.60	2-6	0.10-0.17	0.0-2.9	0.5-1.0	.32	.32	5	3	86
	13-20	70-100	0-30	2-10	1.50-1.70	2-20	0.03-0.09	0.0-2.9	0.0-0.5	.17	.17			
	20-30	70-100	0-30	2-10	1.50-1.70	2-20	0.03-0.09	0.0-2.9	0.0-0.5	.17	.17			
	30-49	20-45	15-53	27-30	1.30-1.70	0.6-2	0.14-0.20	0.0-2.9	0.5-2.0	.32	.32			
	49-80	43-85	0-50	2-10	1.50-1.70	2-20	0.03-0.09	0.0-2.9	0.0-0.5	.17	.17			
<b>HdGB:</b>														
Hardeman-----	0-7	70-90	0-30	10-15	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	7-18	32-90	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	18-37	32-85	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	37-47	32-90	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	47-106	32-90	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
<b>Grandmore-----</b>														
	0-18	43-85	0-50	10-18	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	18-27	45-80	0-27	18-20	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.5-1.0	.32	.32			
	27-49	45-80	0-27	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	49-60	20-80	0-53	18-35	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.0-0.4	.32	.32			
	60-80	0-45	0-53	30-45	1.35-1.65	0.2-0.6	0.12-0.20	3.0-5.9	0.0-0.2	.32	.32			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
<b>HdGC:</b>														
Hardeman-----	0-6	43-85	0-50	10-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	6-13	32-85	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	13-24	32-85	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	24-48	32-85	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	48-80	32-85	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
<b>Grandmore-----</b>	0-15	43-85	0-50	10-18	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	15-30	45-80	0-27	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.5-1.0	.32	.32			
	30-54	0-80	0-53	20-45	1.35-1.65	0.2-0.6	0.12-0.20	3.0-5.9	0.3-0.4	.32	.32			
	54-70	0-45	0-53	30-45	1.35-1.65	0.2-0.6	0.12-0.20	3.0-5.9	0.0-0.2	.32	.32			
	70-80	45-80	0-27	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.5-1.0	.32	.32			
<b>HdmB:</b>														
Hardeman-----	0-9	43-85	0-50	10-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	9-24	32-85	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	24-42	32-85	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	42-53	32-85	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	53-80	32-85	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
<b>HdmC:</b>														
Hardeman-----	0-9	43-85	0-50	10-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	9-27	32-85	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	27-34	32-85	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	34-59	32-85	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	59-80	32-85	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
<b>IreA:</b>														
Irene-----	0-8	0-50	50-88	15-26	1.30-1.50	0.6-2	0.16-0.24	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	8-14	0-32	40-82	18-27	1.45-1.70	0.2-0.6	0.18-0.22	3.0-5.9	1.0-2.0	.32	.32			
	14-23	0-45	15-73	27-35	1.45-1.70	0.2-0.6	0.15-0.22	3.0-5.9	0.0-0.5	.32	.32			
	23-49	0-45	15-73	27-35	1.45-1.70	0.2-0.6	0.15-0.22	3.0-5.9	0.0-0.5	.32	.32			
	49-80	0-80	0-88	15-30	1.40-1.70	0.6-2	0.12-0.20	0.0-2.9	0.0-0.5	.37	.37			
<b>IreB:</b>														
Irene-----	0-9	0-50	50-88	15-26	1.30-1.50	0.6-2	0.16-0.24	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	9-14	0-32	40-82	18-27	1.45-1.70	0.2-0.6	0.18-0.22	3.0-5.9	1.0-2.0	.32	.32			
	14-29	0-45	15-73	27-35	1.45-1.70	0.2-0.6	0.15-0.22	3.0-5.9	0.0-0.5	.32	.32			
	29-44	0-45	15-73	27-35	1.45-1.70	0.2-0.6	0.15-0.22	3.0-5.9	0.0-0.5	.32	.32			
	44-80	0-45	15-73	27-35	1.45-1.70	0.2-0.6	0.15-0.22	3.0-5.9	0.0-0.5	.32	.32			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
IreC:														
Irene-----	0-15	0-50	50-88	15-26	1.30-1.50	0.6-2	0.16-0.24	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	15-23	0-32	40-82	27-35	1.45-1.70	0.2-0.6	0.18-0.22	3.0-5.9	1.0-2.0	.32	.32			
	23-46	0-45	15-73	27-35	1.45-1.70	0.2-0.6	0.15-0.22	3.0-5.9	0.0-0.5	.32	.32			
	46-59	0-45	15-73	18-27	1.45-1.70	0.2-0.6	0.15-0.22	3.0-5.9	0.0-0.5	.32	.32			
	59-80	0-80	0-88	15-30	1.40-1.70	0.6-2	0.12-0.20	0.0-2.9	0.0-0.5	.37	.37			
IreD:														
Irene-----	0-11	0-50	50-88	15-26	1.30-1.50	0.6-2	0.16-0.24	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	11-22	0-45	15-73	27-35	1.45-1.70	0.2-0.6	0.18-0.22	3.0-5.9	1.0-2.0	.32	.32			
	22-36	0-45	15-73	27-35	1.45-1.70	0.2-0.6	0.15-0.22	3.0-5.9	0.0-0.5	.32	.32			
	36-51	0-45	15-73	27-35	1.45-1.70	0.2-0.6	0.15-0.22	3.0-5.9	0.0-0.5	.32	.32			
	51-80	0-80	0-88	15-30	1.40-1.70	0.6-2	0.12-0.20	0.0-2.9	0.0-0.5	.37	.37			
JssF:														
Jester-----	0-5	86-100	0-14	2-10	1.35-1.50	6-20	0.05-0.08	0.0-2.9	0.5-1.0	.15	.15	5	1	220
	5-16	70-100	0-30	2-12	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.15	.15			
	16-42	70-100	0-30	2-12	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.15	.15			
	42-57	70-100	0-30	2-12	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.15	.15			
	57-80	70-100	0-30	2-12	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.15	.15			
JstC:														
Jester-----	0-7	70-90	0-30	5-12	1.35-1.50	6-20	0.07-0.11	0.0-2.9	0.5-1.0	.17	.17	5	2	134
	7-40	70-100	0-30	2-12	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.15	.15			
	40-80	70-100	0-30	2-12	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.15	.15			
KidB:														
Kingsdown-----	0-14	43-85	0-50	8-18	1.40-1.50	2-6	0.15-0.18	0.0-2.9	1.0-2.0	.20	.20	5	3	86
	14-23	43-85	0-50	8-18	1.45-1.55	2-6	0.14-0.17	0.0-2.9	0.5-1.0	.20	.20			
	23-32	43-85	0-50	8-18	1.45-1.55	2-6	0.14-0.17	0.0-2.9	0.5-1.0	.20	.20			
	32-43	43-85	0-50	8-18	1.45-1.55	2-6	0.14-0.17	0.0-2.9	0.5-1.0	.20	.20			
	43-80	32-90	0-50	5-18	1.45-1.55	2-6	0.10-0.17	0.0-2.9	0.0-0.5	.20	.20			
KiHE:														
Kingsdown-----	0-10	32-52	27-50	8-18	1.40-1.50	2-6	0.16-0.18	0.0-2.9	1.0-2.0	.20	.20	5	3	86
	10-25	32-85	0-50	5-18	1.45-1.55	2-6	0.08-0.19	0.0-2.9	0.5-1.0	.24	.24			
	25-38	43-85	0-50	5-18	1.45-1.55	2-6	0.08-0.19	0.0-2.9	0.5-1.0	.24	.24			
	38-80	43-90	0-50	8-18	1.45-1.55	2-6	0.12-0.17	0.0-2.9	0.0-0.5	.24	.24			
Hardeman-----	0-6	32-52	27-50	10-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	6-16	32-85	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	16-39	32-85	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	39-80	43-85	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			



Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
<b>LgtA:</b>														
Lugert-----	0-11	0-50	50-88	10-18	1.30-1.55	0.6-2	0.13-0.20	0.0-2.9	1.0-3.0	.37	.37	5	5	56
	11-36	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.5-1.0	.37	.37			
	36-48	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.5-1.0	.37	.37			
	48-69	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.5-1.0	.37	.37			
	69-88	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.5-1.0	.37	.37			
<b>LiJC:</b>														
Lincoln-----	0-11	43-85	0-50	10-18	1.30-1.60	6-20	0.10-0.15	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	11-19	20-100	0-53	5-35	1.30-1.60	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.17	.17			
	19-80	20-100	0-53	5-35	1.30-1.60	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.17	.17			
<b>Jester-----</b>	0-6	70-90	0-30	5-12	1.35-1.50	6-20	0.07-0.11	0.0-2.9	0.5-1.0	.17	.17	5	2	134
	6-19	70-100	0-30	2-12	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.15	.15			
	19-30	70-100	0-30	2-12	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.15	.15			
	30-80	70-100	0-30	2-12	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.15	.15			
<b>LikB:</b>														
Likes-----	0-7	43-85	0-50	5-15	1.50-1.65	6-20	0.04-0.08	0.0-2.9	0.1-1.0	.15	.15	5	3	86
	7-16	70-100	0-30	5-15	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.1-0.5	.15	.15			
	16-28	70-100	0-30	5-15	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.1-0.5	.15	.15			
	28-42	70-100	0-30	5-15	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.1-0.5	.15	.15			
	42-80	70-100	0-30	5-15	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.1-0.5	.15	.15			
<b>LisA:</b>														
Lincoln-----	0-4	86-100	0-14	0-10	1.30-1.60	6-20	0.10-0.15	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	4-10	20-100	0-53	5-35	1.30-1.60	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.17	.17			
	10-80	20-100	0-53	5-35	1.30-1.60	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.17	.17			
<b>LncA:</b>														
Lincoln-----	0-8	20-45	15-53	27-30	1.30-1.60	0.2-0.6	0.15-0.20	0.0-2.9	0.5-1.0	.28	.28	5	4L	86
	8-19	20-100	0-53	5-35	1.30-1.60	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.17	.17			
	19-28	20-100	0-53	5-35	1.30-1.60	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.17	.17			
	28-34	20-100	0-53	5-35	1.30-1.60	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.17	.17			
	34-80	20-100	0-53	5-35	1.30-1.60	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.17	.17			
<b>LROE:</b>														
Laverne-----	0-8	23-53	27-50	15-27	1.35-1.55	0.6-2	0.10-0.18	0.0-2.9	1.0-3.0	.32	.32	1	4L	86
	8-15	20-53	15-53	15-32	1.45-1.65	0.6-2	0.08-0.12	0.0-2.9	0.1-0.4	.24	.32			
	15-25	20-53	15-53	---	---	0.06-0.6	---	---	---	---	---			
Rock outcrop----	0-24	---	---	---	1.85-2.00	0.0015-1	---	---	---	---	---	--	8	---

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
<b>LshA:</b>														
Lesho-----	0-11	20-45	15-53	27-35	1.30-1.40	0.2-0.6	0.17-0.19	3.0-5.9	1.0-3.0	.28	.28	4	4L	86
	11-17	20-53	15-53	18-35	1.35-1.45	0.2-0.6	0.16-0.19	3.0-5.9	0.5-1.0	.28	.28			
	17-23	20-85	0-53	18-35	1.35-1.45	0.2-0.6	0.16-0.19	3.0-5.9	0.5-1.0	.28	.28			
	23-34	20-53	15-53	18-35	1.35-1.45	0.2-0.6	0.16-0.19	3.0-5.9	0.5-1.0	.28	.28			
	34-80	70-100	0-30	1-8	1.45-1.55	6-20	0.02-0.10	0.0-2.9	0.0-0.5	.15	.15			
<b>LsoA:</b>														
Lincoln-----	0-7	86-100	0-14	0-10	1.30-1.60	6-20	0.10-0.15	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	7-20	20-100	0-53	5-35	1.30-1.60	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.17	.17			
	20-31	20-100	0-53	5-35	1.30-1.60	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.17	.17			
	31-48	20-100	0-53	5-35	1.30-1.60	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.17	.17			
	48-80	20-100	0-53	5-35	1.30-1.60	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.17	.17			
<b>M-W:</b>														
Water-----	0-80	---	---	---	---	---	---	---	---	---	---	--	---	---
<b>MLBB:</b>														
Mobeetie-----	0-6	32-52	27-50	10-18	1.35-1.50	2-6	0.10-0.14	0.0-2.9	0.5-1.0	.24	.24	3	4L	86
	6-11	32-85	0-50	10-18	1.35-1.50	2-6	0.10-0.14	0.0-2.9	0.5-1.0	.24	.24			
	11-21	32-85	0-50	10-18	1.40-1.55	2-6	0.10-0.14	0.0-2.9	0.5-1.0	.24	.24			
	21-34	32-85	0-50	10-18	1.40-1.55	2-6	0.10-0.14	0.0-2.9	0.5-1.0	.24	.24			
	34-80	32-90	0-50	10-18	1.40-1.55	2-6	0.10-0.14	0.0-2.9	0.5-1.0	.24	.24			
<b>Likes-----</b>	0-5	70-90	0-30	5-15	1.50-1.65	6-20	0.04-0.08	0.0-2.9	0.1-1.0	.15	.15	5	2	134
	5-11	43-100	0-50	5-15	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.1-0.5	.15	.15			
	11-80	70-100	0-30	5-15	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.1-0.5	.15	.15			
<b>Berda-----</b>	0-8	23-53	27-50	10-20	1.40-1.55	2-6	0.10-0.14	0.0-2.9	0.1-1.0	.24	.24	5	4L	86
	8-15	20-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
	15-28	20-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
	28-34	20-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
	34-80	20-100	0-53	2-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
<b>MLBC:</b>														
Mobeetie-----	0-6	43-85	0-50	10-18	1.35-1.50	2-6	0.10-0.14	0.0-2.9	0.5-1.0	.24	.24	3	3	86
	6-19	32-85	0-50	10-18	1.35-1.50	2-6	0.10-0.14	0.0-2.9	0.5-1.0	.24	.24			
	19-25	32-85	0-50	10-18	1.35-1.50	2-6	0.10-0.14	0.0-2.9	0.5-1.0	.24	.24			
	25-36	32-85	0-50	10-18	1.35-1.50	2-6	0.10-0.14	0.0-2.9	0.5-1.0	.24	.24			
	36-80	32-90	0-50	10-18	1.40-1.55	2-6	0.10-0.14	0.0-2.9	0.5-1.0	.24	.24			
<b>Likes-----</b>	0-7	43-85	0-50	5-15	1.50-1.65	6-20	0.04-0.08	0.0-2.9	0.1-1.0	.15	.15	5	3	86
	7-18	70-100	0-30	5-15	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.1-0.5	.15	.15			
	18-80	70-100	0-30	5-15	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.1-0.5	.15	.15			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
<b>MLBC:</b>														
Berda-----	0-6	43-85	0-50	10-20	1.40-1.55	2-6	0.10-0.14	0.0-2.9	0.1-1.0	.24	.24	5	3	86
	6-15	20-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
	15-27	20-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
	27-34	20-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
	34-80	20-100	0-53	2-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
<b>MLBE:</b>														
Mobeetie-----	0-5	43-85	0-50	10-18	1.35-1.50	2-6	0.10-0.14	0.0-2.9	0.5-1.0	.24	.24	3	3	86
	5-12	32-80	0-50	10-18	1.35-1.50	2-6	0.10-0.14	0.0-2.9	0.5-1.0	.24	.24			
	12-23	32-80	0-50	10-18	1.35-1.50	2-6	0.10-0.14	0.0-2.9	0.5-1.0	.24	.24			
	23-39	32-80	0-50	10-18	1.35-1.50	2-6	0.10-0.14	0.0-2.9	0.5-1.0	.24	.24			
	39-80	32-90	0-50	10-18	1.40-1.55	2-6	0.10-0.14	0.0-2.9	0.5-1.0	.24	.24			
<b>Likes-----</b>	0-6	43-85	0-50	5-15	1.50-1.65	6-20	0.04-0.08	0.0-2.9	0.1-1.0	.15	.15	5	3	86
	6-11	70-100	0-30	5-15	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.1-0.5	.15	.15			
	11-27	70-100	0-30	5-15	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.1-0.5	.15	.15			
	27-80	70-100	0-30	5-15	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.1-0.5	.15	.15			
<b>Berda-----</b>	0-5	43-85	0-50	10-20	1.40-1.55	2-6	0.10-0.14	0.0-2.9	0.1-1.0	.24	.24	5	3	86
	5-12	20-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
	12-29	20-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
	29-39	20-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
	39-80	20-100	0-53	2-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
<b>MnsB:</b>														
Mansic-----	0-14	20-45	15-53	27-32	1.35-1.45	0.6-2	0.17-0.22	3.0-5.9	1.0-2.0	.28	.28	5	4L	86
	14-23	20-80	0-53	18-35	1.35-1.70	0.6-2	0.14-0.19	3.0-5.9	0.5-1.0	.32	.32			
	23-35	20-80	0-53	18-35	1.35-1.70	0.6-2	0.14-0.19	3.0-5.9	0.5-1.0	.32	.32			
	35-40	20-80	0-53	18-35	1.35-1.70	0.6-2	0.14-0.19	3.0-5.9	0.5-1.0	.32	.32			
	40-80	20-80	0-53	18-35	1.35-1.70	0.6-2	0.14-0.19	3.0-5.9	0.5-1.0	.32	.32			
<b>MnsC:</b>														
Mansic-----	0-7	20-45	15-53	27-32	1.35-1.45	0.6-2	0.17-0.22	3.0-5.9	1.0-2.0	.28	.28	5	4L	86
	7-21	20-80	0-53	18-35	1.35-1.70	0.6-2	0.14-0.19	3.0-5.9	0.5-1.0	.32	.32			
	21-36	20-80	0-53	18-35	1.35-1.70	0.6-2	0.14-0.19	3.0-5.9	0.5-1.0	.32	.32			
	36-80	20-80	0-53	18-35	1.35-1.70	0.6-2	0.14-0.19	3.0-5.9	0.5-1.0	.32	.32			
<b>MsnB:</b>														
Manson-----	0-7	23-53	27-50	18-27	1.35-1.50	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.28	.28	3	4L	86
	7-13	20-80	0-53	25-35	1.40-1.55	0.6-2	0.10-0.16	0.0-2.9	0.1-0.5	.32	.32			
	13-23	20-80	0-53	20-35	1.45-1.60	0.6-2	0.10-0.18	0.0-2.9	0.1-0.5	.32	.32			
	23-41	20-80	0-53	20-35	1.45-1.60	0.6-2	0.10-0.18	0.0-2.9	0.1-0.5	.32	.32			
	41-80	20-80	0-53	20-35	1.45-1.60	0.6-2	0.10-0.18	0.0-2.9	0.1-0.5	.32	.32			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
<b>MsnC:</b>														
Manson-----	0-11	23-53	27-50	18-27	1.35-1.50	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.28	.28	3	4L	86
	11-19	20-80	0-53	25-35	1.40-1.55	0.6-2	0.10-0.16	0.0-2.9	0.1-0.5	.32	.32			
	19-35	20-80	0-53	20-35	1.45-1.60	0.6-2	0.10-0.18	0.0-2.9	0.1-0.5	.32	.32			
	35-66	20-80	0-53	20-35	1.45-1.60	0.6-2	0.10-0.18	0.0-2.9	0.1-0.5	.32	.32			
	66-80	20-80	0-53	20-35	1.45-1.60	0.6-2	0.10-0.18	0.0-2.9	0.1-0.5	.32	.32			
<b>MsnC2:</b>														
Manson-----	0-12	23-53	27-50	15-27	1.35-1.50	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.28	.28	3	4L	86
	12-30	20-80	0-53	25-35	1.40-1.55	0.6-2	0.10-0.16	0.0-2.9	0.1-0.5	.32	.32			
	30-44	20-80	0-53	20-35	1.45-1.60	0.6-2	0.10-0.18	0.0-2.9	0.1-0.5	.32	.32			
	44-55	20-80	0-53	20-35	1.45-1.60	0.6-2	0.10-0.18	0.0-2.9	0.1-0.5	.32	.32			
	55-80	20-80	0-53	20-35	1.45-1.60	0.6-2	0.10-0.18	0.0-2.9	0.1-0.5	.32	.32			
<b>OMBE:</b>														
Okark-----	0-10	43-85	0-50	0-20	1.30-1.60	0.6-2	0.14-0.20	0.0-2.9	1.0-3.0	.32	.32	3	3	86
	10-28	32-85	0-50	10-18	1.40-1.70	2-6	0.10-0.20	0.0-2.9	1.0-2.0	.32	.32			
	28-41	32-85	0-50	7-18	1.40-1.70	2-6	0.10-0.20	0.0-2.9	0.0-1.0	.32	.32			
	41-80	32-85	0-50	7-18	1.40-1.70	2-6	0.10-0.20	0.0-2.9	0.0-1.0	.32	.32			
<b>Mansic-----</b>	0-12	23-53	27-50	18-27	1.30-1.60	0.6-2	0.15-0.20	3.0-5.9	1.0-3.0	.32	.32	4	6	48
	12-28	20-45	0-53	18-35	1.40-1.70	0.6-2	0.13-0.19	3.0-5.9	0.5-2.0	.37	.37			
	28-56	20-80	0-53	18-35	1.40-1.70	0.6-2	0.10-0.20	0.0-2.9	0.0-1.0	.37	.37			
	56-80	20-80	0-53	10-35	1.40-1.70	0.6-6	0.15-0.20	0.0-2.9	0.0-0.5	.32	.32			
<b>Berda-----</b>	0-9	23-53	27-50	18-27	1.35-1.45	0.6-2	0.17-0.22	0.0-2.9	0.5-2.0	.32	.32	5	4L	86
	9-27	20-80	0-53	18-35	1.35-1.70	0.6-2	0.15-0.19	3.0-5.9	0.5-1.0	.32	.32			
	27-47	20-80	0-53	18-35	1.35-1.70	0.6-2	0.15-0.19	3.0-5.9	0.5-1.0	.32	.32			
	47-80	20-80	0-50	12-35	1.35-1.70	0.6-2	0.15-0.19	3.0-5.9	0.0-0.5	.32	.32			
<b>OMBG:</b>														
Okark-----	0-10	43-85	0-50	7-18	1.30-1.55	2-6	0.14-0.20	0.0-2.9	1.0-3.0	.32	.32	3	3	86
	10-21	32-85	0-50	10-18	1.40-1.70	2-6	0.10-0.20	0.0-2.9	1.0-2.0	.32	.32			
	21-80	32-85	0-50	7-18	1.40-1.70	2-6	0.10-0.20	0.0-2.9	0.0-1.0	.32	.32			
<b>Mansic-----</b>	0-12	23-53	27-50	18-27	1.30-1.55	0.6-2	0.13-0.19	0.0-2.9	1.0-3.0	.37	.37	4	4L	86
	12-21	20-80	0-53	18-35	1.40-1.70	0.6-2	0.13-0.19	3.0-5.9	0.5-2.0	.37	.37			
	21-39	20-80	0-53	18-35	1.40-1.70	0.6-2	0.10-0.20	0.0-2.9	0.0-1.0	.37	.37			
	39-80	20-80	0-53	10-35	1.40-1.70	0.6-6	0.15-0.20	0.0-2.9	0.0-0.5	.32	.32			
<b>Berda-----</b>	0-7	23-53	27-50	18-27	1.35-1.50	0.6-2	0.12-0.16	0.0-2.9	0.1-1.0	.28	.28	5	4L	86
	7-22	20-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
	22-47	20-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			
	47-80	20-80	0-53	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.28	.28			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
PdoA:														
Paloduro-----	0-9	20-45	15-53	27-35	1.30-1.45	0.6-2	0.14-0.18	0.0-2.9	1.0-3.0	.28	.28	5	4L	86
	9-14	20-80	0-53	18-35	1.45-1.60	0.6-2	0.12-0.18	0.0-2.9	0.1-0.5	.28	.28			
	14-27	20-80	0-53	18-35	1.45-1.60	0.6-2	0.12-0.18	0.0-2.9	0.1-0.5	.28	.28			
	27-80	20-80	0-53	18-35	1.45-1.60	0.6-2	0.12-0.18	0.0-2.9	0.1-0.5	.28	.28			
PdoB:														
Paloduro-----	0-10	20-45	15-53	27-35	1.40-1.55	0.6-2	0.12-0.18	0.0-2.9	1.0-3.0	.28	.28	5	4L	86
	10-20	20-80	0-53	18-35	1.45-1.60	0.6-2	0.12-0.18	0.0-2.9	0.1-0.5	.28	.28			
	20-35	20-80	0-53	18-35	1.45-1.60	0.6-2	0.12-0.18	0.0-2.9	0.1-0.5	.28	.28			
	35-44	23-53	27-50	18-27	1.40-1.55	0.6-2	0.12-0.18	0.0-2.9	1.0-3.0	.28	.28			
	44-80	20-80	0-53	18-35	1.45-1.60	0.6-2	0.12-0.18	0.0-2.9	0.1-0.5	.28	.28			
PdoC2:														
Paloduro-----	0-10	20-45	15-53	27-35	1.30-1.45	0.6-2	0.14-0.18	0.0-2.9	1.0-3.0	.28	.28	5	4L	86
	10-25	20-80	0-53	18-35	1.45-1.60	0.6-2	0.12-0.18	0.0-2.9	0.1-0.5	.28	.28			
	25-49	20-80	0-53	18-35	1.45-1.60	0.6-2	0.12-0.18	0.0-2.9	0.1-0.5	.28	.28			
	49-80	20-80	0-53	18-35	1.45-1.60	0.6-2	0.12-0.18	0.0-2.9	0.1-0.5	.28	.28			
PIT:														
Pits-----	0-60	---	---	---	1.35-1.70	0.06-6	---	---	---	---	---	--	8	0
PlmB:														
Plemons-----	0-8	23-53	27-50	15-27	1.35-1.50	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.32	.32	5	4L	86
	8-21	20-80	0-53	25-35	1.35-1.55	0.6-2	0.12-0.18	3.0-5.9	0.1-0.5	.32	.32			
	21-46	20-80	0-53	20-35	1.35-1.55	0.6-2	0.12-0.18	3.0-5.9	0.1-0.5	.32	.32			
	46-80	20-80	0-53	20-35	1.40-1.60	0.6-2	0.10-0.18	3.0-5.9	0.1-0.5	.32	.32			
PlmC:														
Plemons-----	0-8	23-53	27-50	15-27	1.35-1.50	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.32	.32	5	4L	86
	8-18	20-80	0-53	20-35	1.35-1.55	0.6-2	0.12-0.18	3.0-5.9	0.1-0.5	.32	.32			
	18-42	20-80	0-53	20-35	1.40-1.60	0.6-2	0.10-0.18	3.0-5.9	0.1-0.5	.32	.32			
	42-60	20-80	0-53	20-35	1.40-1.60	0.6-2	0.10-0.18	3.0-5.9	0.1-0.5	.32	.32			
	60-80	20-80	0-53	20-35	1.40-1.60	0.6-2	0.10-0.18	3.0-5.9	0.1-0.5	.32	.32			
PlmD:														
Plemons-----	0-8	23-53	27-50	15-27	1.35-1.50	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.32	.32	5	4L	86
	8-19	20-80	0-53	20-35	1.35-1.55	0.6-2	0.12-0.18	3.0-5.9	0.1-0.5	.32	.32			
	19-37	20-80	0-53	20-35	1.40-1.60	0.6-2	0.10-0.18	3.0-5.9	0.1-0.5	.32	.32			
	37-60	20-80	0-53	20-35	1.40-1.60	0.6-2	0.10-0.18	3.0-5.9	0.1-0.5	.32	.32			
	60-80	20-80	0-53	20-35	1.40-1.60	0.6-2	0.10-0.18	3.0-5.9	0.1-0.5	.32	.32			
QnWC3:														
Quinlan-----	0-13	23-53	27-50	10-27	1.30-1.70	0.6-6	0.07-0.22	0.0-2.9	0.5-1.0	.37	.37	1	5	56
	13-18	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
QnWC3:														
Woodward-----	0-3	33-53	30-50	10-18	1.30-1.60	0.6-2	0.15-0.24	0.0-2.9	0.5-2.0	.37	.37	2	5	56
	3-30	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	30-35	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---			
QnWD:														
Quinlan-----	0-6	23-53	27-50	15-27	1.30-1.55	0.6-2	0.15-0.24	0.0-2.9	0.5-1.0	.37	.37	2	5	56
	6-15	0-53	15-82	10-30	1.30-1.70	0.6-6	0.07-0.22	0.0-2.9	0.5-1.0	.37	.37			
	15-24	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---			
Woodward-----	0-8	0-50	50-88	10-18	1.30-1.60	0.6-2	0.15-0.24	0.0-2.9	0.5-2.0	.37	.37	3	5	56
	8-18	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	18-25	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	25-29	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---			
QnWE:														
Quinlan-----	0-6	23-53	27-50	15-27	1.30-1.55	0.6-2	0.15-0.24	0.0-2.9	0.5-1.0	.37	.37	2	4L	86
	6-14	0-53	15-82	10-30	1.30-1.70	0.6-6	0.07-0.22	0.0-2.9	0.5-1.0	.37	.37			
	14-18	0-53	15-82	10-30	1.30-1.70	0.6-6	0.07-0.22	0.0-2.9	0.5-1.0	.37	.37			
	18-22	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---			
Woodward-----	0-4	43-85	0-50	10-18	1.30-1.60	0.6-2	0.15-0.24	0.0-2.9	0.5-2.0	.37	.37	3	3	86
	4-16	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	16-22	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	22-26	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---			
QRWG:														
Quinlan-----	0-8	23-53	27-50	15-27	1.30-1.55	0.6-2	0.15-0.24	0.0-2.9	0.5-1.0	.37	.37	2	5	56
	8-13	0-53	15-82	10-30	1.30-1.70	0.6-6	0.07-0.22	0.0-2.9	0.5-1.0	.37	.37			
	13-18	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---			
Rock outcrop----	0-60	---	---	---	1.85-2.00	0.06-2	---	---	---	---	---	--	8	---
Woodward-----	0-6	33-53	30-50	10-18	1.30-1.60	0.6-2	0.15-0.24	0.0-2.9	0.5-2.0	.37	.37	3	5	56
	6-14	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	14-22	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	22-25	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---			
QRYG:														
Quinlan-----	0-8	23-53	27-50	15-27	1.30-1.55	0.6-2	0.15-0.24	0.0-2.9	0.5-1.0	.37	.37	2	5	56
	8-14	0-53	0-53	10-30	1.30-1.70	0.6-6	0.07-0.22	0.0-2.9	0.5-1.0	.37	.37			
	14-18	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---			
Rock outcrop----	0-60	---	---	---	1.85-2.00	0.06-2	---	---	---	---	---	--	8	---

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
QRYG:														
Yomont-----	0-11	33-53	30-50	10-20	1.30-1.45	2-6	0.16-0.22	0.0-2.9	0.5-1.0	.49	.49	5	4L	86
	11-22	0-85	0-88	10-18	1.40-1.60	2-6	0.14-0.20	0.0-2.9	0.1-0.5	.49	.49			
	22-38	0-85	0-88	10-18	1.40-1.60	2-6	0.14-0.20	0.0-2.9	0.1-0.5	.49	.49			
	38-52	0-85	0-88	10-18	1.40-1.60	2-6	0.14-0.20	0.0-2.9	0.1-0.5	.49	.49			
	52-80	0-85	0-88	10-18	1.40-1.60	2-6	0.14-0.20	0.0-2.9	0.1-0.5	.49	.49			
QWDE:														
Quinlan-----	0-6	43-85	0-50	10-18	1.30-1.55	0.6-2	0.13-0.20	0.0-2.9	0.5-1.0	.37	.37	2	3	86
	6-9	0-53	15-88	10-30	1.30-1.70	0.6-6	0.07-0.22	0.0-2.9	0.5-1.0	.37	.37			
	9-16	0-53	15-88	10-30	1.30-1.70	0.6-6	0.07-0.22	0.0-2.9	0.5-1.0	.37	.37			
	16-43	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---			
Woodward-----	0-10	0-50	50-88	10-18	1.30-1.60	0.6-2	0.13-0.20	0.0-2.9	0.5-2.0	.37	.37	3	3	86
	10-17	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	17-25	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	25-27	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---			
Deepwood-----	0-12	43-85	0-50	10-18	1.30-1.60	0.6-2	0.13-0.20	0.0-2.9	0.5-2.0	.37	.37	5	3	86
	12-28	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	28-80	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	80-92	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	92-106	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
QWRC:														
Quinlan-----	0-6	43-85	0-50	10-18	1.30-1.55	0.6-2	0.13-0.20	0.0-2.9	0.5-1.0	.37	.37	2	3	86
	6-14	0-85	0-88	10-30	1.30-1.70	0.6-6	0.07-0.22	0.0-2.9	0.5-1.0	.37	.37			
	14-18	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---			
Woodward-----	0-6	43-85	0-50	10-18	1.30-1.60	0.6-2	0.13-0.20	0.0-2.9	0.5-2.0	.37	.37	3	3	86
	6-18	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	18-28	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	28-38	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	38-42	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---			
Rock outcrop----	0-60	---	---	---	1.85-2.00	0.06-2	---	---	---	---	---	--	8	---
RoCH:														
Rock outcrop----	0-60	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---	--	1	---
Cottonwood-----	0-9	23-53	27-50	18-27	1.30-1.50	0.6-2	0.11-0.18	0.0-2.9	0.5-1.0	.32	.32	1	4L	86
	9-13	---	---	---	---	0.2-20	---	---	---	---	---			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
RssA:														
Rosston-----	0-13	0-45	0-40	50-60	1.20-1.40	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-2.0	.32	.32	5	7	38
	13-31	0-45	0-60	50-60	1.25-1.40	0.0015-0.06	0.12-0.18	9.0-25.0	0.1-1.0	.32	.32			
	31-51	0-45	0-60	50-60	1.30-1.45	0.06-0.2	0.11-0.15	9.0-25.0	0.1-1.0	.32	.32			
	51-80	0-45	0-60	50-60	1.30-1.45	0.06-0.2	0.11-0.15	9.0-25.0	0.1-0.5	.32	.32			
SAL:														
Salt flats-----	0-14	86-100	0-14	2-10	1.30-1.50	6-20	0.01-0.03	0.0-2.9	0.5-1.0	.20	.20	4	1	220
	14-40	20-100	0-53	2-39	1.40-1.70	0.2-0.6	0.01-0.10	0.0-2.9	0.5-1.0	.32	.32			
	40-80	43-100	0-50	2-10	1.40-1.70	6-20	0.01-0.03	0.0-2.9	0.5-1.0	.20	.20			
SelA:														
Selman-----	0-15	0-50	50-88	10-25	1.30-1.50	0.6-2	0.16-0.24	0.0-2.9	1.0-3.0	.37	.37	5	5	56
	15-25	0-85	0-88	10-25	1.30-1.65	0.6-2	0.13-0.24	0.0-2.9	1.0-3.0	.37	.37			
	25-38	0-45	15-82	20-35	1.30-1.75	0.2-2	0.15-0.24	3.0-5.9	0.0-1.0	.37	.37			
	38-55	0-45	15-82	20-35	1.30-1.75	0.2-2	0.15-0.24	3.0-5.9	0.0-1.0	.37	.37			
	55-80	0-53	27-88	5-27	1.30-1.65	0.6-2	0.15-0.24	0.0-2.9	0.0-0.5	.37	.37			
SelB:														
Selman-----	0-5	0-50	50-88	10-25	1.30-1.50	0.6-2	0.16-0.24	0.0-2.9	1.0-3.0	.37	.37	5	5	56
	5-16	0-85	0-88	10-25	1.30-1.65	0.6-2	0.13-0.24	0.0-2.9	1.0-3.0	.37	.37			
	16-51	0-45	15-82	20-35	1.30-1.75	0.2-2	0.15-0.24	3.0-5.9	0.0-1.0	.37	.37			
	51-61	0-45	15-82	20-35	1.30-1.75	0.2-2	0.15-0.24	3.0-5.9	0.0-1.0	.37	.37			
	61-80	0-53	27-88	5-27	1.30-1.65	0.6-2	0.15-0.24	0.0-2.9	0.0-0.5	.37	.37			
SelC:														
Selman-----	0-8	0-50	50-88	10-25	1.30-1.50	0.6-2	0.16-0.24	0.0-2.9	1.0-3.0	.37	.37	5	5	56
	8-14	0-85	0-88	10-25	1.30-1.65	0.6-2	0.13-0.24	0.0-2.9	1.0-3.0	.37	.37			
	14-27	0-45	15-88	20-35	1.30-1.75	0.2-2	0.15-0.24	3.0-5.9	0.0-1.0	.37	.37			
	27-56	0-45	15-88	20-35	1.30-1.75	0.2-2	0.15-0.24	3.0-5.9	0.0-1.0	.37	.37			
	56-80	0-53	27-88	5-27	1.30-1.65	0.6-2	0.15-0.24	0.0-2.9	0.0-0.5	.37	.37			
SelC2:														
Selman-----	0-6	0-50	50-88	10-25	1.30-1.50	0.6-2	0.16-0.24	0.0-2.9	1.0-3.0	.37	.37	5	5	56
	6-18	0-85	0-88	10-25	1.30-1.65	0.6-2	0.13-0.24	0.0-2.9	1.0-3.0	.37	.37			
	18-31	0-45	15-82	20-35	1.30-1.75	0.2-2	0.15-0.24	3.0-5.9	0.0-1.0	.37	.37			
	31-54	0-45	15-82	20-35	1.30-1.75	0.2-2	0.15-0.24	3.0-5.9	0.0-1.0	.37	.37			
	54-80	0-53	27-88	5-27	1.30-1.65	0.6-2	0.15-0.24	0.0-2.9	0.0-0.5	.37	.37			
SelD:														
Selman-----	0-9	0-50	50-88	10-25	1.30-1.50	0.6-2	0.16-0.24	0.0-2.9	1.0-3.0	.37	.37	5	5	56
	9-16	0-85	0-88	10-25	1.30-1.65	0.6-2	0.13-0.24	0.0-2.9	1.0-3.0	.37	.37			
	16-61	0-45	12-82	20-35	1.30-1.75	0.2-2	0.15-0.24	3.0-5.9	0.0-1.0	.37	.37			
	61-80	0-53	27-88	5-27	1.30-1.65	0.6-2	0.15-0.24	0.0-2.9	0.0-0.5	.37	.37			



Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
SelD2: Selman-----	0-7	0-50	55-88	10-25	1.30-1.50	0.6-2	0.16-0.24	0.0-2.9	1.0-3.0	.37	.37	5	5	56
	7-24	0-45	15-82	20-35	1.30-1.75	0.2-2	0.15-0.24	3.0-5.9	0.0-1.0	.37	.37			
	24-43	0-45	15-82	20-35	1.30-1.75	0.2-2	0.15-0.24	3.0-5.9	0.0-1.0	.37	.37			
	43-80	0-53	27-88	5-27	1.30-1.65	0.6-2	0.15-0.24	0.0-2.9	0.0-0.5	.37	.37			
SprA: Spr-----	0-12	23-53	27-50	20-27	1.30-1.45	0.6-2	0.14-0.20	3.0-5.9	1.0-3.0	.37	.37	5	4L	86
	12-21	20-80	0-53	20-35	1.45-1.60	0.6-2	0.14-0.20	3.0-5.9	0.5-1.0	.32	.32			
	21-39	20-80	0-53	20-35	1.45-1.60	0.6-2	0.14-0.20	3.0-5.9	0.5-1.0	.32	.32			
	39-80	20-80	0-53	20-35	1.45-1.60	0.6-2	0.14-0.20	3.0-5.9	0.5-1.0	.32	.32			
SpsA: Spr-----	0-18	23-53	27-50	20-27	1.30-1.45	0.6-2	0.14-0.20	3.0-5.9	1.0-3.0	.37	.37	5	4L	86
	18-35	20-80	0-53	20-35	1.45-1.60	0.6-2	0.14-0.20	3.0-5.9	0.5-1.0	.32	.32			
	35-57	20-80	0-53	20-35	1.45-1.60	0.6-2	0.14-0.20	3.0-5.9	0.5-1.0	.32	.32			
	57-80	20-80	0-53	20-35	1.45-1.60	0.6-2	0.14-0.20	3.0-5.9	0.5-1.0	.32	.32			
StpA: St. Paul-----	0-13	0-50	50-88	15-27	1.30-1.55	0.6-2	0.15-0.24	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	13-22	0-45	15-82	18-35	1.45-1.70	0.2-0.6	0.15-0.22	3.0-5.9	1.0-3.0	.32	.32			
	22-66	0-53	15-82	18-40	1.45-1.70	0.2-0.6	0.15-0.22	3.0-5.9	0.5-2.0	.32	.32			
	66-77	0-45	27-82	20-40	1.40-1.70	0.2-0.6	0.15-0.22	3.0-5.9	0.0-1.0	.37	.37			
	77-88	0-45	27-82	15-35	1.40-1.70	0.2-2	0.15-0.22	3.0-5.9	0.0-1.0	.37	.37			
StpB: St. Paul-----	0-13	0-50	50-88	15-27	1.30-1.55	0.6-2	0.15-0.24	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	13-20	0-45	15-82	27-35	1.45-1.70	0.2-0.6	0.15-0.22	3.0-5.9	1.0-3.0	.32	.32			
	20-31	0-45	15-82	27-40	1.45-1.70	0.2-0.6	0.15-0.22	3.0-5.9	0.5-2.0	.32	.32			
	31-45	0-53	27-82	20-40	1.40-1.70	0.2-0.6	0.15-0.22	3.0-5.9	0.0-1.0	.37	.37			
	45-86	0-53	27-82	15-35	1.40-1.70	0.2-2	0.15-0.22	3.0-5.9	0.0-1.0	.37	.37			
StpC: St. Paul-----	0-11	0-50	50-88	15-27	1.30-1.55	0.6-2	0.15-0.24	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	11-20	0-53	15-82	18-35	1.40-1.70	0.6-2	0.15-0.22	0.0-2.9	1.0-3.0	.37	.37			
	20-33	0-45	15-82	27-35	1.45-1.70	0.2-0.6	0.15-0.22	3.0-5.9	1.0-3.0	.32	.32			
	33-51	0-45	15-82	27-40	1.45-1.70	0.2-0.6	0.15-0.22	3.0-5.9	0.5-2.0	.32	.32			
	51-80	0-53	27-82	20-40	1.40-1.70	0.2-0.6	0.15-0.22	3.0-5.9	0.0-1.0	.37	.37			
StpD: St. Paul-----	0-9	0-50	50-88	15-27	1.30-1.55	0.6-2	0.15-0.24	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	9-22	0-45	15-73	27-35	1.45-1.70	0.2-0.6	0.15-0.22	3.0-5.9	1.0-3.0	.32	.32			
	22-42	0-45	15-73	27-40	1.45-1.70	0.2-0.6	0.15-0.22	3.0-5.9	0.5-2.0	.32	.32			
	42-61	0-53	15-73	20-40	1.40-1.70	0.2-0.6	0.15-0.22	3.0-5.9	0.0-1.0	.37	.37			
	61-80	0-53	15-73	15-35	1.40-1.70	0.2-2	0.15-0.22	3.0-5.9	0.0-1.0	.37	.37			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
TeWE:														
Teagard-----	0-9	20-45	15-53	27-40	1.30-1.60	0.06-0.2	0.15-0.22	3.0-5.9	1.0-2.0	.43	.43	3	4	86
	9-18	0-45	0-65	35-60	1.35-1.70	0.0015-0.06	0.14-0.22	6.0-8.9	1.0-2.0	.37	.37			
	18-30	0-45	0-65	35-60	1.35-1.70	0.0015-0.06	0.14-0.22	6.0-8.9	1.0-2.0	.37	.37			
	30-38	0-45	0-65	35-60	1.35-1.60	0.0015-0.06	0.14-0.18	6.0-8.9	0.5-1.0	.37	.37			
	38-40	---	---	---	1.85-2.00	0.0015-0.06	---	---	---	---	---			
Wellsford-----	0-7	20-45	15-45	27-40	1.35-1.55	0.0015-0.06	0.12-0.14	6.0-8.9	0.5-2.0	.32	.32	2	4	86
	7-16	0-45	0-60	35-60	1.45-1.65	0.0015-0.06	0.10-0.12	6.0-8.9	0.5-1.0	.32	.32			
	16-20	---	---	---	1.85-2.00	0.0000-0.01	0.00-0.00	---	---	---	---			
TexA:														
Texroy-----	0-13	23-53	27-50	15-27	1.30-1.45	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	13-24	20-80	0-53	22-35	1.45-1.60	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.32	.32			
	24-37	20-80	0-53	22-35	1.45-1.60	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.32	.32			
	37-63	20-80	0-53	22-35	1.45-1.60	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.32	.32			
	63-80	20-80	0-53	20-40	1.45-1.60	0.2-2	0.10-0.18	0.0-2.9	0.5-1.0	.32	.32			
TexB:														
Texroy-----	0-11	23-53	27-50	15-27	1.30-1.45	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	11-23	20-80	0-53	22-35	1.45-1.60	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.32	.32			
	23-42	20-80	0-53	22-35	1.45-1.60	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.32	.32			
	42-64	20-80	0-53	22-35	1.45-1.60	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.32	.32			
	64-80	20-45	15-53	20-40	1.45-1.60	0.2-2	0.10-0.18	0.0-2.9	0.5-1.0	.32	.32			
TexC:														
Texroy-----	0-12	23-53	27-50	15-27	1.30-1.45	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	12-20	20-80	0-53	22-35	1.45-1.60	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.32	.32			
	20-35	20-80	0-53	22-35	1.45-1.60	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.32	.32			
	35-51	20-80	0-53	22-35	1.45-1.60	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.32	.32			
	51-80	20-45	15-53	20-40	1.45-1.60	0.2-2	0.10-0.18	0.0-2.9	0.5-1.0	.32	.32			
TipA:														
Tipton-----	0-10	23-53	27-50	15-20	1.30-1.55	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.37	.37	5	5	56
	10-21	20-53	15-50	20-32	1.40-1.70	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32			
	21-45	20-53	15-50	20-32	1.40-1.70	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32			
	45-62	20-53	15-50	20-32	1.40-1.70	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32			
	62-80	20-53	15-50	20-32	1.40-1.70	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32			
TipB:														
Tipton-----	0-8	23-53	27-50	15-20	1.30-1.55	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.37	.37	5	5	56
	8-26	20-53	15-50	20-32	1.40-1.70	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32			
	26-38	20-53	15-50	20-32	1.40-1.70	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32			
	38-55	20-53	15-50	20-32	1.40-1.70	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32			
	55-80	20-53	15-50	20-32	1.40-1.70	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
TipC: Tipton-----	0-23	23-53	27-50	15-20	1.30-1.55	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.37	.37	5	5	56
	23-35	20-53	15-50	20-32	1.40-1.70	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32			
	35-49	20-53	15-50	20-32	1.40-1.70	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32			
	49-72	20-53	15-50	20-32	1.40-1.70	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32			
	72-80	20-53	15-50	20-32	1.40-1.70	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32			
TipD: Tipton-----	0-17	23-53	27-50	15-20	1.30-1.55	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.37	.37	5	5	56
	17-22	23-53	27-50	15-20	1.30-1.55	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.37	.37			
	22-50	20-53	15-50	20-32	1.40-1.70	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32			
	50-70	20-85	0-53	0-32	1.40-1.70	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32			
	70-80	20-85	0-53	0-32	1.40-1.70	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32			
TRQC: Talpa-----	0-12	23-53	27-50	20-27	1.30-1.45	0.6-2	0.12-0.18	0.0-2.9	1.0-3.0	.32	.32	1	4L	86
	12-14	---	---	---	---	0.06-2	---	---	---	---	---			
Rock outcrop----	0-14	---	---	---	1.85-2.35	0.0015-0.06	0.00-0.00	---	---	---	---	--	8	---
Quinlan-----	0-8	23-53	27-50	15-27	1.30-1.55	0.6-2	0.15-0.24	0.0-2.9	0.5-1.0	.37	.37	2	5	56
	8-14	15-53	15-88	10-30	1.30-1.70	0.6-6	0.07-0.22	0.0-2.9	0.5-1.0	.37	.37			
	14-20	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---			
TvlC: Tivoli-----	0-7	86-100	0-14	3-7	1.35-1.50	6-20	0.07-0.11	0.0-2.9	0.5-1.0	.15	.15	5	1	220
	7-80	86-100	0-14	1-5	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.15	.15			
TvlE: Tivoli-----	0-13	86-100	0-14	3-7	1.35-1.50	6-20	0.07-0.11	0.0-2.9	0.5-1.0	.15	.15	5	1	220
	13-20	70-100	0-30	1-5	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.15	.15			
	20-80	70-100	0-30	1-5	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.15	.15			
TvlG: Tivoli-----	0-8	86-100	0-14	3-7	1.35-1.50	6-20	0.07-0.11	0.0-2.9	0.5-1.0	.15	.15	5	1	220
	8-18	70-100	0-30	1-5	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.15	.15			
	18-40	70-100	0-30	1-5	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.15	.15			
	40-80	70-100	0-30	1-5	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.15	.15			
VerB: Vernon-----	0-5	20-45	15-45	35-40	1.40-1.60	0.06-0.2	0.12-0.17	6.0-8.9	0.5-2.0	.43	.43	3	4	86
	5-11	0-45	15-60	35-60	1.35-1.60	0.0015-0.06	0.10-0.15	6.0-8.9	0.1-1.0	.37	.37			
	11-22	0-45	15-60	40-60	1.35-1.60	0.0015-0.06	0.10-0.15	6.0-8.9	0.1-1.0	.37	.37			
	22-34	0-45	15-60	40-60	1.35-1.60	0.0015-0.06	0.10-0.15	6.0-8.9	0.1-1.0	.37	.37			
	34-39	---	---	---	1.85-2.00	0.0000-0.03	---	---	---	---	---			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
VerC: Vernon-----	0-6	20-45	15-45	35-40	1.40-1.60	0.06-0.2	0.12-0.17	6.0-8.9	0.5-2.0	.43	.43	3	4	86
	6-35	0-45	0-60	40-60	1.35-1.60	0.0015-0.06	0.10-0.15	6.0-8.9	0.1-1.0	.37	.37			
	35-39	---	---	---	1.85-2.00	0.0000-0.03	---	---	---	---	---			
VerD: Vernon-----	0-5	20-45	15-45	35-40	1.40-1.60	0.06-0.2	0.12-0.17	6.0-8.9	0.5-2.0	.43	.43	3	4	86
	5-13	0-45	0-60	40-60	1.35-1.60	0.0015-0.06	0.10-0.15	6.0-8.9	0.1-1.0	.37	.37			
	13-26	0-45	0-60	40-60	1.35-1.60	0.0015-0.06	0.10-0.15	6.0-8.9	0.1-1.0	.37	.37			
	26-39	---	---	---	1.85-2.00	0.0000-0.03	---	---	---	---	---			
VrrB: Vernon-----	0-4	43-85	0-50	5-20	1.35-1.45	2-6	0.13-0.15	0.0-2.9	0.5-2.0	.37	.37	3	3	86
	4-10	20-85	15-53	0-40	1.40-1.60	0.2-0.6	0.12-0.18	6.0-8.9	0.1-0.5	.43	.43			
	10-31	0-45	0-65	35-60	1.35-1.60	0.0015-0.06	0.10-0.15	6.0-8.9	0.1-0.5	.37	.37			
	31-39	0-45	0-65	35-60	1.35-1.60	0.0015-0.06	0.10-0.15	6.0-8.9	0.1-0.5	.37	.37			
	39-47	---	---	---	1.85-2.00	0.0000-0.03	---	---	---	---	---			
VrrC: Vernon-----	0-16	43-85	0-50	5-20	1.35-1.45	2-6	0.13-0.15	0.0-2.9	0.5-2.0	.37	.37	3	3	86
	16-22	0-50	0-57	20-40	1.40-1.60	0.2-0.6	0.12-0.18	6.0-8.9	0.1-0.5	.43	.43			
	22-31	0-45	0-60	40-60	1.35-1.60	0.0015-0.06	0.10-0.15	6.0-8.9	0.1-0.5	.37	.37			
	31-37	0-45	0-60	40-60	1.35-1.60	0.0015-0.06	0.10-0.15	6.0-8.9	0.1-0.5	.37	.37			
	37-41	---	---	---	1.85-2.00	0.0000-0.03	---	---	---	---	---			
W: Water-----	0-80	---	---	---	---	---	---	---	---	---	---	--	---	---
WodA: Woods-----	0-16	20-45	15-53	27-40	1.30-1.60	0.2-0.6	0.15-0.22	3.0-5.9	1.0-5.0	.43	.43	5	4	86
	16-26	0-45	0-65	35-60	1.35-1.60	0.0015-0.06	0.14-0.22	6.0-8.9	1.0-2.0	.37	.37			
	26-42	0-45	0-65	27-60	1.35-1.70	0.06-0.2	0.15-0.22	6.0-8.9	0.5-1.0	.37	.37			
	42-62	0-45	0-65	27-60	1.35-1.70	0.06-0.2	0.15-0.22	6.0-8.9	0.5-1.0	.37	.37			
	62-80	0-45	0-65	18-60	1.30-1.70	0.06-0.6	0.15-0.24	6.0-8.9	0.5-1.0	.37	.37			
WodB: Woods-----	0-11	20-45	15-53	27-40	1.30-1.60	0.2-0.6	0.15-0.22	3.0-5.9	1.0-5.0	.43	.43	5	4	86
	11-26	0-45	0-65	35-60	1.35-1.60	0.0015-0.06	0.14-0.22	6.0-8.9	1.0-2.0	.37	.37			
	26-41	0-45	0-65	27-60	1.35-1.70	0.06-0.2	0.15-0.22	6.0-8.9	0.5-1.0	.37	.37			
	41-60	0-45	0-65	27-60	1.35-1.70	0.06-0.2	0.15-0.22	6.0-8.9	0.5-1.0	.37	.37			
	60-80	0-45	0-65	18-60	1.30-1.70	0.06-0.6	0.15-0.24	6.0-8.9	0.5-1.0	.37	.37			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
WodC:														
Woods-----	0-10	20-45	15-53	27-40	1.30-1.60	0.2-0.6	0.15-0.22	3.0-5.9	1.0-5.0	.43	.43	4	4	86
	10-13	0-45	0-65	27-40	1.30-1.60	0.2-0.6	0.15-0.22	3.0-5.9	1.0-5.0	.43	.43			
	13-51	0-45	0-65	35-60	1.35-1.60	0.0015-0.06	0.14-0.22	6.0-8.9	1.0-2.0	.37	.37			
	51-69	0-45	0-65	27-60	1.35-1.70	0.06-0.2	0.15-0.22	6.0-8.9	0.5-1.0	.37	.37			
	69-80	0-45	0-65	18-60	1.30-1.70	0.06-0.6	0.15-0.24	6.0-8.9	0.5-1.0	.37	.37			
WQHE:														
Westola-----	0-11	32-52	27-50	10-18	1.30-1.55	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32	5	5	56
	11-18	32-85	0-50	5-18	1.40-1.70	2-6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
	18-28	32-90	0-50	5-18	1.40-1.70	2-6	0.07-0.20	0.0-2.9	0.0-0.5	.32	.32			
	28-34	32-90	0-50	5-18	1.40-1.70	2-6	0.07-0.20	0.0-2.9	0.0-0.5	.32	.32			
	34-80	32-90	0-50	5-18	1.40-1.70	2-6	0.07-0.20	0.0-2.9	0.0-0.5	.32	.32			
Quinlan-----	0-8	23-53	27-50	15-27	1.30-1.55	0.6-2	0.15-0.24	0.0-2.9	0.5-1.0	.37	.37	2	5	56
	8-15	15-53	15-67	10-30	1.30-1.70	0.6-6	0.07-0.22	0.0-2.9	0.5-1.0	.37	.37			
	15-18	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---			
Hardeman-----	0-9	32-53	27-50	10-18	1.35-1.55	2-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28	5	5	56
	9-18	32-85	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	18-35	32-85	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	35-47	32-85	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	47-80	32-85	0-50	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
WQnB:														
Woodward-----	0-8	33-53	30-50	10-18	1.30-1.60	0.6-2	0.15-0.24	0.0-2.9	0.5-2.0	.37	.37	3	5	56
	8-19	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	19-25	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	25-30	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---			
Quinlan-----	0-6	23-53	27-50	15-27	1.30-1.55	0.6-2	0.15-0.24	0.0-2.9	0.5-1.0	.37	.37	2	5	56
	6-18	15-85	0-88	10-30	1.30-1.70	0.6-6	0.07-0.22	0.0-2.9	0.5-1.0	.37	.37			
	18-22	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---			
WQnC:														
Woodward-----	0-7	33-53	27-50	10-18	1.30-1.60	0.6-2	0.15-0.24	0.0-2.9	0.5-2.0	.37	.37	3	5	56
	7-30	0-85	0-88	10-18	1.40-1.65	0.6-2	0.13-0.24	0.0-2.9	0.0-0.5	.37	.37			
	30-35	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---			
Quinlan-----	0-8	23-53	27-50	15-27	1.30-1.55	0.6-2	0.15-0.24	0.0-2.9	0.5-1.0	.37	.37	2	5	56
	8-13	15-83	0-88	10-30	1.30-1.70	0.6-6	0.07-0.22	0.0-2.9	0.5-1.0	.37	.37			
	13-18	---	---	---	1.85-2.00	0.2-0.6	---	---	---	---	---			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
WslA: Westola-----	0-8	43-85	0-50	10-18	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	8-16	32-85	0-50	5-18	1.40-1.70	2-6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
	16-27	43-90	0-50	5-18	1.40-1.70	2-6	0.07-0.20	0.0-2.9	0.0-0.5	.32	.32			
	27-33	20-80	0-50	5-35	1.40-1.70	2-6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
	33-80	43-90	0-50	5-18	1.40-1.70	2-6	0.07-0.20	0.0-2.9	0.0-0.5	.32	.32			
WstA: Westola-----	0-10	43-85	0-50	10-18	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	10-25	32-85	0-50	5-18	1.40-1.70	2-6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
	25-43	32-85	0-50	5-18	1.40-1.70	2-6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
	43-90	20-90	0-53	5-35	1.40-1.70	2-6	0.07-0.20	0.0-2.9	0.0-0.5	.32	.32			
	90-99	43-90	0-50	5-18	1.40-1.70	2-6	0.07-0.20	0.0-2.9	0.0-0.5	.32	.32			
YmrA: Yomont-----	0-12	33-53	30-50	10-20	1.30-1.45	2-6	0.16-0.22	0.0-2.9	0.5-1.0	.49	.49	5	4L	86
	12-24	0-85	0-88	10-18	1.40-1.60	2-6	0.14-0.20	0.0-2.9	0.1-0.5	.49	.49			
	24-31	0-85	0-88	10-18	1.40-1.60	2-6	0.14-0.20	0.0-2.9	0.1-0.5	.49	.49			
	31-39	0-85	0-88	10-18	1.40-1.60	2-6	0.14-0.20	0.0-2.9	0.1-0.5	.49	.49			
	39-80	0-85	0-88	10-18	1.40-1.60	2-6	0.14-0.20	0.0-2.9	0.1-0.5	.49	.49			
YmtA: Yomont-----	0-7	33-53	30-50	10-20	1.30-1.45	2-6	0.16-0.22	0.0-2.9	0.5-1.0	.49	.49	5	4L	86
	7-16	0-85	0-88	10-18	1.40-1.60	2-6	0.14-0.20	0.0-2.9	0.1-0.5	.49	.49			
	16-21	0-85	0-88	10-18	1.40-1.60	2-6	0.14-0.20	0.0-2.9	0.1-0.5	.49	.49			
	21-60	0-85	0-88	10-18	1.40-1.60	2-6	0.14-0.20	0.0-2.9	0.1-0.5	.49	.49			
	60-80	15-100	0-85	0-18	1.40-1.60	2-6	0.14-0.20	0.0-2.9	0.1-0.5	.49	.49			

## Physical Analyses of Selected Soils

The results of physical analyses of several pedons are given in table 20, "Physical Analyses of Selected Soils." The data are for soils sampled at carefully selected sites. The pedons are typical of the series in this survey. The Soil Survey Laboratory, Lincoln, Nebraska, analyzed the soil samples.

Most determinations, except for those for grain-size analysis and bulk density, were made on soil material smaller than 2 millimeters in diameter. Measurements reported as percent or quantity of unit weight were calculated on an oven-dry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods (USDA-NRCS, 1996).

*Clay*—(fraction less than 0.002 mm) pipette extraction, weight percentages of all material less than 2 mm (3A1).

*Silt*—(0.002-0.05 mm fraction) pipette extraction, weight percentages of all material less than 2 mm (3A1).

*Sand*—(0.05-2.0 mm fraction) weight percentages of material less than 2 mm (3A1).

*Bulk density*—of less than 2 mm material, saran-coated clods field moist (4A1a), 1/3-bar (4A1d), oven-dry (4A1h).

*Water-retention difference*—between 1/3-bar and 15-bars for whole soil (4C1).

*Water retained*—pressure extraction, percentage of oven-dry weight of less than 2 mm material; 1/3- or 1/10-bar (4B1), 15-bars (4B2).

*Linear extensibility*—change in clod dimension based on whole soil (4D).

Table 20.--Physical Analyses of Selected Soils

[Dashes indicate that analyses were not made. TR means trace]

Soil name and sample number*	Hori- zon	Depth	Particle-size distribution										Bulk density		Water reten- tion	Water content		COLE
			Clay (<0.002)	Silt			Sand						1/3- bar	Oven- dry	differ- ence 1/3-bar 15-bar	1/3- bar	15- bar	
				Total silt	Fine (0.002- 0.05mm)	Coarse (0.02- 0.05 mm)	Total sand	Very fine	Fine	Medium	Coarse	Very coarse						
				(0.002- 0.05mm)	-0.02 mm)	0.05 mm)	(0.05 -2.0 mm)	(0.05 mm)	(0.10 -0.25 mm)	(0.25 -0.50 mm)	(0.5 -1mm)	(1.0- 2.0mm)						
In			Percent										g/cm3	g/cm3	(cm/cm)	Percent		
Abbie: S93OK-059-007	Ap1	0-6	21.8	44.1	15.2	28.9	34.1	15.3	12.4	5.0	1.1	0.3	---	---	----	---	9.8	---
	Ap2	6-12	24.4	44.2	16.7	27.6	31.4	15.1	10.7	4.9	0.7	TR	1.39	1.53	0.14	21.7	11.8	0.033
	Bt1	12-17	28.7	40.3	14.1	26.2	31.0	11.7	12.7	5.7	0.8	0.1	1.64	1.66	0.04	15.7	13.5	0.004
	Bt2	17-24	23.2	33.4	9.9	23.5	43.4	16.1	19.7	6.6	0.9	0.1	1.48	1.61	0.15	21.2	11.2	0.028
	Btk1	24-33	21.1	31.5	11.8	19.7	47.4	13.6	25.4	7.7	0.6	0.1	1.46	1.54	0.09	15.6	9.3	0.018
	BtK2	33-44	26.6	26.9	12.0	14.9	46.5	8.0	25.5	11.3	1.4	0.3	1.53	1.60	0.07	15.1	10.8	0.015
	Akb	44-49	26.6	37.0	15.1	22.0	36.4	8.1	18.0	8.9	1.3	0.1	1.48	1.52	0.10	17.4	10.8	0.009
	Btkb1	49-63	30.3	33.3	13.6	19.7	36.4	8.5	18.8	8.1	0.9	0.1	1.53	1.64	0.09	18.2	12.5	0.023
	Btkb2	63-72	43.5	26.3	12.8	13.5	30.2	6.0	16.5	6.3	1.0	0.4	1.59	1.78	0.07	21.9	17.3	0.038
	Btkb3	72-80	39.6	26.0	12.4	13.6	34.4	6.0	18.8	8.3	1.1	0.2	1.63	1.79	0.01	16.2	15.7	0.032
Btkb4	80-90	21.3	27.8	11.7	16.1	50.9	5.2	29.9	13.8	1.7	0.3	1.61	1.64	0.08	13.6	8.4	0.006	
Deepwood: S94OK-059-011	A	0-4	11.8	39.5	8.3	31.2	48.7	37.7	9.7	1.0	0.3	TR	1.32	1.34	0.13	16.2	6.2	0.005
	A2	4-12	12.1	38.3	7.9	30.4	49.6	39.4	9.0	0.8	0.3	0.1	1.31	1.37	0.15	17.3	5.8	0.015
	Bk1	12-23	11.0	38.2	8.7	29.5	50.8	38.2	11.4	0.8	0.3	0.1	1.34	1.35	0.12	15.1	6.0	0.002
	Bk2	23-28	9.7	38.0	10.7	27.3	52.3	41.1	9.3	1.2	0.5	0.2	1.30	1.34	0.09	12.2	5.6	0.010
	Bk3	28-39	9.7	36.5	10.2	26.3	53.8	42.7	9.5	1.2	0.4	TR	1.28	1.31	0.23	23.7	5.4	0.008
	Bk4	39-56	10.4	35.4	10.2	25.2	54.2	41.8	10.4	1.3	0.5	0.2	1.38	1.43	0.12	14.1	5.4	0.012
	Bk4	56-67	11.2	35.7	11.0	24.7	53.1	40.6	10.5	1.4	0.5	0.1	1.43	1.47	0.10	12.0	5.2	0.009
	Bk4	67-79	10.9	36.6	11.6	25.0	52.5	40.8	9.8	1.3	0.4	0.2	1.45	1.50	0.10	12.4	5.5	0.011
	BCK	79-92	10.0	33.5	10.0	23.5	56.5	39.6	14.7	1.5	0.5	0.2	1.48	1.52	0.10	12.2	5.1	0.009
Ck	92-99	8.5	28.8	9.2	19.6	62.7	39.0	16.1	5.2	2.1	0.3	1.53	1.57	0.17	15.8	4.3	0.009	
Devol: S94OK-059-010	A	0-6	6.3	7.5	2.0	5.5	86.2	9.5	52.3	23.1	1.1	0.2					2.6	
	Btd	6-10	11.4	7.2	2.5	4.7	81.4	8.9	51.5	19.8	1.0	0.2	1.62	1.71	0.10	10.7	4.4	0.018
	Bt2	10-23	9.1	5.6	2.2	3.4	85.3	9.7	53.8	21.3	0.5	TR	1.55	1.63	0.08	8.6	3.7	0.017
	Bw	23-38	9.0	5.5	1.8	3.7	85.5	10.2	53.8	20.9	0.6	TR	1.62	1.67	0.05	6.4	3.3	0.010
	2Bk	38-49	8.5	5.4	2.2	3.2	86.1	8.6	53.1	22.2	2.2	---	1.54	1.61	0.10	9.6	3.4	0.015
	2Bw	49-60	9.8	7.3	2.3	5.0	82.9	12.2	49.6	20.7	0.4	TR	1.49	1.55	0.16	14.4	4.0	0.013
	2Bw2	60-69	9.4	7.3	2.4	5.0	83.3	9.3	57.8	16.0	0.2	---	1.57	1.57	0.12	11.8	4.0	---
	2Btk	69-76	11.3	9.6	2.9	6.7	79.1	18.3	41.9	18.5	0.4	---	1.45	1.55	0.26	22.9	5.0	0.022
	2C1	76-91	8.9	6.2	2.0	4.2	84.9	11.5	40.2	29.4	3.7	0.1	1.58	1.63	0.05	6.7	3.8	0.010
	2C2	91-98	11.6	8.9	2.3	6.6	79.5	17.2	47.3	13.7	1.0	0.3	1.57	1.63	0.14	13.6	4.8	0.013

\* See footnote at end of table.



Table 20.--Physical Analyses of Selected Soils--Continued

Soil name and sample number*	Hori- zon	Depth	Particle-size distribution										Bulk		Water	Water		COLE
			Clay (<0.002)	Silt			Sand						density		reten-	content		
				Total	Fine	Coarse	Total	Very	Fine	Medium	Coarse	Very	1/3- bar	Oven- dry	tion differ- ence 1/3-bar 15-bar	1/3- bar	15- bar	
				(0.002- 0.05mm)	(0.002 -0.02 mm)	(0.02- 0.05 mm)	(0.05 -2.0 mm)	(0.05 -0.10 mm)	(0.10 -0.25 mm)	(0.25 -0.50 mm)	(0.5 -1mm)	(1.0- 2.0mm)						
In			Percent										g/cm3	g/cm3	(cm/cm)	Percent		
Eda: S94OK-059-014	A	0-4	4.0	11.0	3.6	7.4	85.0	8.7	48.7	25.2	2.1	0.3	1.65	1.67	0.02	4.4	3.0	0.004
	Bt1	4-10	6.2	7.9	2.4	5.5	85.9	10.2	49.8	23.9	2.0	TR	1.58	1.62	0.04	5.8	3.4	0.008
	Bt2	10-18	6.9	6.1	1.9	4.2	86.6	9.3	50.2	25.5	1.6	TR	1.53	1.60	0.07	8.4	3.6	0.015
	BC	18-28	6.9	6.1	2.1	4.0	87.0	9.8	51.8	23.3	2.1	TR	1.60	1.65	0.04	5.6	3.4	0.010
	C	28-45	5.6	6.9	2.9	4.0	87.5	6.3	46.0	31.6	3.5	0.1	1.62	1.68	0.06	6.5	3.1	0.012
	2C1	45-52	5.0	4.9	1.9	3.0	90.1	6.7	48.6	32.1	2.6	0.1	1.64	1.68	0.04	5.5	2.9	0.008
	2C2	52-59	5.8	6.6	2.4	4.2	87.6	7.2	39.7	34.8	5.9	TR	1.65	1.70	0.05	5.8	2.8	0.010
	2C3	59-69	5.7	6.3	2.7	3.6	88.0	8.1	48.4	29.1	2.0	0.4	1.63	1.68	0.07	7.4	3.0	0.010
	2C4	69-85	7.0	6.2	1.9	4.3	86.8	7.7	38.3	35.0	5.8	TR	1.61	1.67	0.06	7.4	3.4	0.012
2C5	85-99	9.2	13.4	4.0	9.4	77.4	14.4	25.6	29.1	7.7	0.6	1.40	1.52	0.24	22.4	5.0	0.028	
Jester: S93OK-059-001	A	0-5	1.6	8.6	1.8	6.8	89.8	6.4	39.2	39.5	4.4	0.3	---	----	----	---	2.2	---
	AC	5-17	0.9	6.5	1.3	5.3	92.6	9.7	44.1	35.3	3.4	0.1	---	---	----	---	1.6	---
	C1	17-42	0.8	2.5	0.2	2.3	96.7	7.7	39.6	44.0	5.3	0.1	---	---	----	---	1.3	---
	2C2	42-57	0.1	3.0	0.7	2.3	96.9	5.6	36.9	46.0	8.1	0.3	---	---	----	---	1.2	---
	2C3	57-79	0.8	9.5	0.2	9.3	89.7	1.5	34.1	46.5	7.6	TR	---	---	----	---	1.2	---
Lincoln: S93OK-059-008	A	0-7	2.7	6.6	3.2	3.4	90.7	11.3	47.4	27.2	4.1	0.7	1.66	1.67	0.05	4.9	1.8	0.002
	AC	7-19	1.5	7.4	1.1	6.3	91.1	13.2	50.3	24.1	3.4	0.1	1.63	1.63	0.05	4.5	1.4	0.002
	C1	19-30	1.1	5.7	0.8	4.9	93.2	8.8	49.2	30.4	4.2	0.6	---	---	----	---	1.0	---
	C2	30-47	1.1	5.4	0.6	4.8	93.5	10.5	51.4	27.9	3.2	0.5	---	---	----	---	1.0	---
	C3	47-56	0.8	2.9	0.6	2.3	96.3	1.4	15.7	51.9	23.4	3.9	---	---	----	---	0.9	---
	C4	56-71	0.9	2.7	0.4	2.3	96.4	1.9	33.7	53.6	7.0	0.2	---	---	----	---	0.8	---
Lugert: S94OK-059-016	A1	0-4	15.2	51.6	13.7	37.9	33.2	26.1	4.6	1.8	0.6	0.1	1.26	1.35	0.06	13.3	8.4	0.023
	A2	4-11	15.7	53.9	15.2	38.7	30.4	24.6	3.6	1.3	0.6	0.3	---	---	----	---	8.1	---
	Bw	11-18	13.5	46.0	12.4	33.6	40.5	30.7	6.2	2.6	0.8	0.2	---	---	----	---	7.1	---
	Bk1	18-26	13.6	45.0	11.0	34.0	41.4	30.6	7.6	2.5	0.5	0.2	1.29	1.36	0.18	21.2	6.9	0.018
	Bk2	26-36	12.9	49.1	12.2	36.9	38.0	32.1	4.7	0.9	0.2	0.1	1.35	1.42	0.20	22.0	7.0	0.017
	Ckz	36-48	14.9	52.5	14.7	37.8	32.6	30.2	2.1	0.2	0.1	TR	1.48	1.56	0.21	22.4	7.9	0.018
	Azb1	48-55	18.1	58.6	17.1	41.5	23.3	20.7	1.4	0.7	0.4	0.1	1.35	1.45	0.20	24.0	9.5	0.024
	Azb2	55-69	20.5	51.1	16.8	34.3	28.4	21.9	3.4	1.5	1.0	0.6	1.47	1.52	----	6.7	9.6	0.011
	Cz1	69-78	19.4	46.4	14.5	31.9	34.2	25.5	5.3	2.3	1.0	0.1	1.28	1.39	0.21	26.9	10.5	0.028
	Cz2	78-88	16.5	45.4	12.5	32.9	38.1	30.1	5.6	1.8	0.4	0.2	1.38	1.48	0.21	22.7	8.4	0.024

\* See footnote at end of table.

Table 20.--Physical Analyses of Selected Soils--Continued

Soil name and sample number*	Hori- zon	Depth	Particle-size distribution										Bulk		Water	Water		COLE
			Clay (<0.002)	Silt			Sand						density		reten- tion	content		
				Total silt	Fine	Coarse	Total	Very	Fine	Medium	Coarse	Very	1/3- bar	Oven- dry	differ- ence 1/3-bar 15-bar	1/3- bar	15- bar	
				(0.002- 0.05mm)	(0.002 mm)	(0.02- 0.05 mm)	(0.05 -2.0 mm)	(0.05 -0.10 mm)	(0.10 -0.25 mm)	(0.25 -0.50 mm)	(0.5 -1mm)	(1.0- 2.0mm)						
In			Percent										g/cm3	g/cm3	(cm/cm)	Percent		
Quinlan: S94OK-059-012	A	0-6	9.4	44.3	12.6	31.7	46.3	38.7	6.3	0.9	0.2	0.2	1.34	1.39	0.18	19.8	6.2	0.012
	Bk1	6-9	10.4	43.7	14.7	29.0	45.9	38.8	5.3	1.0	0.5	0.3	1.37	1.42	0.19	20.1	6.5	0.012
	Bk2	9-16	9.4	48.2	18.0	30.2	42.4	34.1	5.2	1.8	0.8	0.5	1.40	1.44	0.13	15.4	6.2	0.009
	Cr1	16-22	5.3	40.4	14.4	26.0	54.3	45.3	7.7	0.4	0.4	0.5	1.77	1.80	0.17	14.0	4.6	0.006
	Cr2s	22-33	5.2	54.7	17.5	37.2	40.1	34.9	4.1	0.3	0.2	0.6	1.73	1.76	0.20	16.5	4.8	0.006
	Cr3	33-43	5.4	49.5	14.1	35.4	45.1	36.4	6.1	1.0	0.9	0.7	1.84	1.86	0.17	13.2	4.2	0.004
St. Paul: S93OK-059-005	Ap	0-7	16.9	58.2	17.3	40.9	24.9	22.1	1.7	0.8	0.2	0.1	---	---	----	---	8.2	---
	A	7-13	22.3	55.6	18.4	37.2	22.1	20.0	1.5	0.4	0.1	0.1	1.37	1.49	0.16	22.8	11.4	0.028
	Bt	13-22	24.1	56.7	19.9	36.8	19.2	16.5	1.9	0.6	0.1	0.1	1.33	1.46	0.16	23.9	11.9	0.032
	Btk1	22-36	28.8	56.7	24.7	32.0	14.5	13.1	1.1	0.2	0.1	TR	1.43	1.64	0.14	23.8	13.7	0.047
	Btk2	36-52	20.1	55.2	22.2	33.0	24.7	22.8	1.3	0.4	0.2	TR	1.35	1.42	0.11	17.9	10.1	0.017
	Btk3	52-65	13.5	41.6	13.9	27.7	44.9	38.9	5.3	0.6	0.1	TR	1.35	1.44	0.12	16.1	7.1	0.022
	Abt	65-76	23.0	46.2	17.3	28.9	30.8	17.8	3.3	5.0	4.1	0.6	1.50	1.65	0.11	18.0	10.7	0.032
	CB	76-86	21.4	46.1	16.0	30.1	32.5	27.1	3.8	1.0	0.4	0.2	1.40	1.49	0.13	20.2	10.8	0.021
Westola: S94OK-059-015	A1	0-5	9.4	36.9	10.1	26.8	53.7	32.6	14.8	5.4	0.6	0.3	1.39	1.46	0.17	20.0	8.0	0.017
	A2	5-10	7.6	35.0	8.8	26.2	57.4	36.5	15.2	5.4	0.3	TR	1.44	1.50	0.14	14.5	5.0	0.014
	BC1	10-19	4.2	27.9	5.0	22.9	67.9	32.3	23.9	11.1	0.6	TR	1.49	1.53	0.08	9.4	3.9	0.009
	BC2	19-25	4.4	24.3	5.2	19.1	71.3	30.7	30.9	9.2	0.5	---	1.44	1.47	0.17	15.7	3.6	0.007
	BCK	25-42	6.3	28.0	6.0	22.0	65.7	39.4	23.8	2.3	0.2	TR	1.44	1.47	0.18	17.0	4.2	0.007
	C1	42-53	1.0	11.1	3.4	7.7	87.9	27.7	58.5	1.6	0.1	TR	1.51	1.52	0.05	5.8	2.5	0.002
	C2	53-55	6.2	66.6	37.2	29.4	27.2	17.3	7.6	1.7	0.4	0.2	1.43	1.59	0.16	23.9	12.7	0.036
	C3	55-66	4.5	30.1	5.1	25.0	65.4	52.7	12.0	0.5	0.1	0.1	1.52	1.55	0.22	17.9	3.7	0.007
	C4	66-73	7.4	41.1	9.1	32.0	51.5	41.4	8.6	1.3	0.1	0.1	1.44	1.48	0.26	22.9	4.8	0.009
	C5	73-90	17.7	57.0	19.9	37.1	25.3	20.9	2.7	1.5	0.2	---	1.42	1.61	0.25	27.3	9.6	0.043
	C6	90-99	---	3.1	1.7	1.4	96.9	5.7	73.3	16.9	0.6	0.4	---	---	---	---	0.9	---
Yomont: S93OK-059-002	A	0-7	21.7	56.2	26.6	29.6	22.1	18.5	2.6	0.7	0.2	0.1	1.37	1.46	0.13	20.9	11.3	0.021
	AC	7-16	16.2	52.9	20.4	32.5	30.9	26.4	3.7	0.6	0.2	TR	1.33	1.40	0.15	19.6	8.3	0.017
	Ck1	16-29	15.7	48.9	22.8	26.1	35.4	27.2	6.6	1.5	0.1	TR	1.38	1.44	0.14	18.7	8.4	0.014
	Ck2	29-48	19.0	67.0	31.8	35.2	14.0	6.1	4.1	2.8	0.9	0.1	1.39	1.43	0.15	20.5	9.8	0.009
	Ck3	48-60	11.1	53.0	21.4	31.6	35.9	25.1	6.7	3.5	0.5	0.1	1.38	1.41	0.14	15.5	5.2	0.007
	2C1	60-73	0.4	12.7	5.4	7.3	86.9	15.2	15.9	34.6	16.9	4.3	1.56	1.57	0.10	8.5	1.9	0.002
	2C2	73-80	TR	4.0	1.7	2.3	96.8	1.9	10.6	51.6	23.4	9.3					0.8	

\* Pedons are located as follows:

Abbie (S93OK-059-007), about 1,700 feet south and 1,800 feet west of the northeast corner of sec. 23, T. 28 N., R. 26 W. This pedon is the typical pedon for map unit AbbB in the survey area.

Deepwood (S94OK-059-011), about 650 feet south and 500 feet east of the northwest corner of sec. 33, T. 28 N., R. 23 W. This pedon is the typical pedon for map unit QWDE in the survey area.

Devol (S94OK-059-010), about 1,800 feet north and 500 feet east of the southwest corner of sec. 6, T. 27 N., R. 25 W. The surface texture is sandier than is definitive for the Devol map unit. This pedon is the typical pedon for map unit DvlC in the survey area.

Eda (S94OK-059-014), about 4,200 feet south and 2,200 feet west of the northeast corner of sec. 26, T. 25 N., R. 22 W. This pedon is the typical pedon for map unit EdlE in the survey area.

Jester (S93OK-059-001), about 2,000 feet west and 1,900 feet north of the southeast corner of sec. 32, T. 25 N., R. 22 W. This pedon is the typical pedon for map unit JssF in the survey area.

Lincoln (S93OK-059-008), about 2,500 feet east and 2,600 feet north of the southwest corner of sec. 31, T. 26 N., R. 24 W. This pedon is the typical pedon for map unit LsoA in the survey area.

Lugert (S94OK-059-016), about 200 feet west and 50 feet south of the northeast corner of sec. 21, T. 29 N., R. 23 W. This pedon is the typical pedon for map unit LgtA in the survey area.

Quinlan (S94OK-059-012), about 1,700 feet south and 1,700 feet east of the northwest corner of sec. 32, T. 26 N., R. 21 W. This pedon is the typical pedon for map unit QWDE in the survey area.

St. Paul (S93OK-059-005), about 900 feet west and 1,600 feet south of the northeast corner of sec. 32, T. 29 N., R. 22 W. This pedon is the typical pedon for map unit StpB in the survey area.

Westola (S94OK-059-015), about 2,600 feet north and 1,600 feet west of the southeast corner of sec. 17, T. 27 N., R. 21 W. This pedon is the typical pedon for map unit WstA in the survey area.

Yomont (S93OK-059-002), about 2,000 feet east and 1,600 feet south of the northwest corner of sec. 20, T. 26 N., R. 21 W. This pedon is the typical pedon for map unit YmtA in the survey area.

## Chemical Properties

Table 21, "Chemical Properties of the Soils," shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

*Depth* to the upper and lower boundaries of each layer is indicated.

*Cation-exchange capacity* is the total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. Soils having a high cation-exchange capacity can retain cations. The ability to retain cations helps to prevent the pollution of ground water.

*Soil reaction* is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

*Calcium carbonate equivalent* is the percent of carbonates, by weight, in the soil. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

*Gypsum* is given as the percent, by weight, of hydrated calcium sulfates in the soil. Gypsum is partially soluble in water and can be dissolved and removed by water. Soils that have a high content of gypsum (more than 10 percent) may collapse if the gypsum is removed by percolating water.

*Salinity* is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter (decisiemens per meter) at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of the soil if used as construction material, and the potential of the soil to corrode metal and concrete.

*Sodium adsorption ratio* is the measure of sodium relative to calcium and magnesium in the water extract from saturated soil paste. Soils having a sodium adsorption ratio of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

Table 21.--Chemical Properties of the Soils

[Absence of an entry indicates that data were not estimated]

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
AbbA:							
Abbie-----	0-12	7.0-16	6.6-8.4	0-1	0	0	0
	12-23	15-22	7.4-8.4	0-5	0	0	0
	23-42	11-22	7.4-8.4	5-15	0	0	0
	42-80	4.0-19	7.4-8.4	1-15	0	0	0
AbbB:							
Abbie-----	0-12	7.0-16	6.6-8.4	0-1	0	0	0
	12-24	15-22	7.4-8.4	0-5	0	0	0
	24-44	11-22	7.4-8.4	5-15	0	0	0
	44-49	4.0-19	7.4-8.4	1-15	0	0	0
	49-91	11-22	7.4-8.4	5-15	0	0	0
AbbB2:							
Abbie-----	0-7	7.0-16	6.6-8.4	0-1	0	0	0
	7-17	15-22	7.4-8.4	0-5	0	0	0
	17-32	11-22	7.4-8.4	5-15	0	0	0
	32-42	4.0-19	7.4-8.4	1-15	0	0	0
	42-80	4.0-19	7.4-8.4	1-15	0	0	0
AbbC:							
Abbie-----	0-14	7.0-16	6.6-8.4	0-1	0	0	0
	14-26	15-22	7.4-8.4	0-5	0	0	0
	26-38	15-22	7.4-8.4	1-5	0	0	0
	38-56	11-22	7.4-8.4	5-15	0	0	0
	56-80	4.0-19	7.4-8.4	1-15	0	0	0
AbbC2:							
Abbie-----	0-12	7.0-16	6.6-8.4	0-1	0	0	0
	12-23	15-22	7.4-8.4	0-5	0	0	0
	23-37	15-22	7.4-8.4	0-5	0	0	0
	37-51	11-22	7.4-8.4	5-15	0	0	0
	51-80	4.0-19	7.4-8.4	1-15	0	0	0
AbsB:							
Abilene-----	0-9	15-25	6.6-8.4	0-5	0	0.0-2.0	0
	9-18	15-25	6.6-8.4	0-5	0	0.0-2.0	0
	18-26	20-30	6.6-8.4	5-10	0	0.0-2.0	0
	26-57	15-30	7.9-8.4	10-40	0	0.0-2.0	0
	57-80	20-30	7.9-8.4	5-10	0	0.0-2.0	0
Ac1A:							
Abbie-----	0-13	16-19	6.6-8.4	0-1	0	0	0
	13-24	15-22	7.4-8.4	0-5	0	0	0
	24-61	11-22	7.4-8.4	5-15	0	0	0
	61-67	4.0-19	7.4-8.4	1-15	0	0	0
	67-80	4.0-19	7.4-8.4	1-15	0	0	0
AflB:							
Abbie-----	0-7	5.0-11	6.6-8.4	0-1	0	0	0
	7-14	4.0-19	7.4-8.4	1-5	0	0	0
	14-47	4.0-19	7.4-8.4	1-15	0	0	0
	47-80	4.0-19	7.4-8.4	1-15	0	0	0

Table 21.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
Af1C:							
Abbie-----	0-13	5.0-11	6.6-8.4	0-1	0	0	0
	13-27	15-22	7.4-8.4	0-5	0	0	0
	27-45	11-22	7.4-8.4	5-15	0	0	0
	45-57	4.0-19	7.4-8.4	1-15	0	0	0
	57-80	4.0-19	7.4-8.4	1-15	0	0	0
BdaB:							
Berda-----	0-6	8.0-15	7.9-8.4	1-5	0	0.0-2.0	0
	6-19	10-15	7.9-8.4	1-20	0	0.0-2.0	0
	19-39	10-15	7.9-8.4	1-20	0	0.0-2.0	0
	39-80	10-15	7.9-8.4	1-20	0	0.0-2.0	0
BdaC:							
Berda-----	0-8	8.0-15	7.9-8.4	1-5	0	0.0-2.0	0
	8-17	10-15	7.9-8.4	1-20	0	0.0-2.0	0
	17-25	10-15	7.9-8.4	1-20	0	0.0-2.0	0
	25-35	10-15	7.9-8.4	1-20	0	0.0-2.0	0
	35-80	10-15	7.9-8.4	1-20	0	0.0-2.0	0
BdaD:							
Berda-----	0-9	8.0-15	7.9-8.4	1-5	0	0.0-2.0	0
	9-25	10-15	7.9-8.4	1-20	0	0.0-2.0	0
	25-46	10-15	7.9-8.4	1-20	0	0.0-2.0	0
	46-80	10-15	7.9-8.4	1-20	0	0.0-2.0	0
CRVE:							
Cottonwood-----	0-8	10-15	7.9-8.4	5-30	5-40	0	0
	8-12	---	---	---	---	---	---
Rock outcrop-----	0-60	---	---	---	40-90	8.0-16.0	---
Vinson-----	0-10	10-18	7.4-8.4	0-10	2-10	0	0
	10-23	12-20	7.9-8.4	5-15	2-20	0	0
	23-34	12-20	7.9-8.4	5-15	2-20	0	0
	34-38	---	---	---	---	---	---
DAM:							
Dam-----	0-80	---	---	---	---	---	---
DevE:							
Devol-----	0-8	5.0-11	5.6-7.8	0	0	0	0
	8-23	2.0-11	6.1-8.4	0	0	0	0
	23-43	2.0-11	6.6-8.4	0	0	0	0
	43-80	2.0-6.0	6.6-8.4	0-1	0	0	0
DpwB:							
Deepwood-----	0-6	7.0-11	6.6-8.4	0-5	0	0	0
	6-21	7.0-11	7.4-8.4	1-15	0	0	0
	21-43	7.0-11	7.4-8.4	1-15	0	0	0
	43-59	7.0-11	7.4-8.4	1-15	0	0	0
	59-80	7.0-11	7.4-8.4	1-10	0	0	0
DpwC:							
Deepwood-----	0-10	7.0-11	6.6-8.4	0-5	0	0	0
	10-23	7.0-11	7.4-8.4	1-15	0	0	0
	23-36	7.0-11	7.4-8.4	1-15	0	0	0
	36-60	7.0-11	7.4-8.4	1-10	0	0	0
	60-80	7.0-11	7.4-8.4	1-10	0	0	0

Table 21.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
DpwD: Deepwood-----	0-12	7.0-11	6.6-8.4	0-5	0	0	0
	12-29	7.0-11	7.4-8.4	1-15	0	0	0
	29-51	7.0-11	7.4-8.4	1-15	0	0	0
	51-80	7.0-11	7.4-8.4	1-10	0	0	0
DpwE: Deepwood-----	0-8	7.0-11	6.6-8.4	0-5	0	0	0
	8-27	7.0-11	7.4-8.4	1-15	0	0	0
	27-53	7.0-11	7.4-8.4	1-15	0	0	0
	53-80	7.0-11	7.4-8.4	1-10	0	0	0
DvlB: Devol-----	0-5	5.0-11	5.6-7.8	0	0	0	0
	5-13	2.0-11	6.1-8.4	0	0	0	0
	13-29	2.0-11	6.6-8.4	0	0	0	0
	29-42	2.0-6.0	6.6-8.4	2-6	0	0	0
	42-80	2.0-6.0	6.6-8.4	0-1	0	0	0
DvlC: Devol-----	0-6	5.0-11	5.6-7.8	0	0	0	0
	6-23	2.0-11	6.1-8.4	0	0	0	0
	23-38	2.0-11	6.6-8.4	0	0	0	0
	38-49	2.0-6.0	6.6-8.4	0-1	0	0	0
	49-80	2.0-6.0	6.6-8.4	0-1	0	0	0
DvlD: Devol-----	0-6	5.0-11	5.6-7.8	0	0	0	0
	6-16	2.0-11	6.1-8.4	0	0	0	0
	16-25	2.0-11	6.6-8.4	0	0	0	0
	25-43	2.0-6.0	6.6-8.4	0-1	0	0	0
	43-80	2.0-6.0	6.6-8.4	0-1	0	0	0
EdlC: Eda-----	0-7	2.0-6.0	5.6-7.3	0	0	0	0
	7-15	1.0-6.0	5.6-7.3	0	0	0	0
	15-23	1.0-6.0	5.6-7.3	0	0	0	0
	23-80	1.0-6.0	6.1-7.3	0-2	0	0	0
EdlE: Eda-----	0-10	2.0-6.0	5.6-7.3	0	0	0	0
	10-19	1.0-6.0	5.6-7.3	0	0	0	0
	19-28	1.0-6.0	5.6-7.3	0	0	0	0
	28-45	1.0-6.0	6.1-7.3	0-2	0	0	0
	45-104	1.0-6.0	6.1-7.3	0-2	0	0	0
FayB: Farry-----	0-13	5.0-11	6.1-7.8	0	0	0	0
	13-35	11-17	6.6-8.4	0-5	0	0	0
	35-47	4.0-17	7.4-8.4	0-5	0	0	0
	47-80	3.0-13	7.4-8.4	0-2	0	0	0
FayC: Farry-----	0-12	5.0-11	6.1-7.8	0	0	0	0
	12-19	11-17	6.6-8.4	0-5	0	0	0
	19-28	4.0-17	7.4-8.4	0-5	0	0	0
	28-42	4.0-17	7.4-8.4	0-5	0	0	0
	42-80	3.0-13	7.4-8.4	0-2	0	0	0

Table 21.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
<b>FoFE:</b>							
Fortyone-----	0-8	5.0-10	6.1-7.8	0	0	0	0
	8-16	5.0-15	6.1-8.4	0	0	0	0
	16-24	3.0-10	6.1-8.4	0-5	0	0	0
	24-34	2.0-7.0	6.6-8.4	0-10	0	0	0
	34-80	2.0-7.0	6.6-8.4	0-10	0	0	0
<b>Farry:</b>							
Farry-----	0-10	5.0-11	6.1-7.8	0	0	0	0
	10-18	11-17	6.6-8.4	0-5	0	0	0
	18-25	4.0-17	7.4-8.4	0-5	0	0	0
	25-36	3.0-13	7.4-8.4	0-2	0	0	0
	36-80	3.0-13	7.4-8.4	0-2	0	0	0
<b>FrkA:</b>							
Frankirk-----	0-8	9.0-18	6.6-7.8	0	0	0.0-2.0	0
	8-15	9.0-18	6.6-7.8	0	0	0.0-2.0	0
	15-24	18-23	6.6-8.4	0-5	0	0.0-2.0	0
	24-58	18-23	6.6-8.4	0-5	0	0.0-2.0	0
	58-80	10-15	7.9-8.4	0-5	0	0.0-2.0	0
<b>FrkB:</b>							
Frankirk-----	0-7	13-18	6.6-7.8	0	0	0.0-2.0	0
	7-18	18-23	6.6-8.4	0-5	0	0.0-2.0	0
	18-37	10-15	7.9-8.4	0-5	0	0.0-2.0	0
	37-65	10-15	7.9-8.4	0-5	0	0.0-2.0	0
	65-80	10-15	7.9-8.4	0-5	0	0.0-2.0	0
<b>FtnB:</b>							
Fortyone-----	0-7	5.0-10	6.1-7.8	0	0	0	0
	7-13	5.0-15	6.1-8.4	0	0	0	0
	13-21	3.0-10	6.1-8.4	0-5	0	0	0
	21-80	2.0-7.0	6.6-8.4	0-10	0	0	0
<b>FtnC:</b>							
Fortyone-----	0-8	5.0-10	6.1-7.8	0	0	0	0
	8-30	5.0-15	6.1-8.4	0	0	0	0
	30-48	3.0-10	6.1-8.4	0-5	0	0	0
	48-80	2.0-7.0	6.6-8.4	0-10	0	0	0
<b>FtnD:</b>							
Fortyone-----	0-6	5.0-10	6.1-7.8	0	0	0	0
	6-18	5.0-15	6.1-8.4	0	0	0	0
	18-27	5.0-15	6.1-8.4	0	0	0	0
	27-39	3.0-10	6.1-8.4	0-5	0	0	0
	39-80	2.0-7.0	6.6-8.4	0-10	0	0	0
<b>GcsA:</b>							
Gracemore-----	0-9	10-17	7.4-8.4	0-1	0	0.0-4.0	0
	9-16	2.0-7.0	7.9-8.4	0-1	0	0.0-4.0	0
	16-25	2.0-7.0	7.9-8.4	0-1	0	0.0-4.0	0
	25-36	16-19	7.9-8.4	0-1	0	0.0-4.0	0
	36-80	2.0-7.0	7.9-8.4	0-1	0	0.0-4.0	0
<b>GdfB:</b>							
Grandfield-----	0-12	9.0-14	6.1-7.8	0	0	0	0
	12-47	14-21	6.1-7.8	0-5	0	0	0
	47-56	14-21	6.6-8.4	1-5	0	0	0
	56-68	14-21	6.6-8.4	1-5	0	0	0
	68-94	12-18	6.6-8.4	0-5	0	0	0



Table 21.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
<b>GdfC:</b>							
Grandfield-----	0-8	9.0-14	6.1-7.8	0	0	0	0
	8-25	14-21	6.1-7.8	0	0	0	0
	25-43	14-21	6.1-7.8	0	0	0	0
	43-61	14-21	6.6-8.4	0	0	0	0
	61-80	12-18	6.6-8.4	0-5	0	0	0
<b>GDGE:</b>							
Grandfield-----	0-8	9.0-14	6.1-7.8	0	0	0	0
	8-16	14-21	6.1-7.8	0	0	0	0
	16-36	14-21	6.6-8.4	0	0	0	0
	36-60	12-18	6.6-8.4	0-5	0	0	0
	60-80	12-18	6.6-8.4	0-5	0	0	0
<b>Devol-----</b>	0-13	5.0-11	5.6-7.8	0	0	0	0
	13-29	2.0-11	6.6-8.4	0	0	0	0
	29-38	2.0-6.0	6.6-8.4	0-1	0	0	0
	38-45	2.0-6.0	6.6-8.4	0-1	0	0	0
	45-80	2.0-11	6.6-8.4	0	0	0	0
<b>Grandmore-----</b>	0-15	6.0-11	6.6-8.4	0	0	0	0
	15-30	11-18	7.4-8.4	0	0	0	0
	30-54	18-27	7.4-8.4	2-5	0	0	0
	54-70	18-27	7.4-8.4	0	0	0	0
	70-80	18-27	7.4-8.4	0	0	0	0
<b>GdmB:</b>							
Grandmore-----	0-10	6.0-11	6.6-8.4	0	0	0	0
	10-22	11-18	7.4-8.4	0	0	0	0
	22-34	11-18	7.4-8.4	0	0	0	0
	34-47	11-18	7.4-8.4	0	0	0	0
	47-80	11-18	7.4-8.4	0	0	0	0
<b>GfsA:</b>							
Gracemore-----	0-8	9.0-17	7.4-8.4	1-10	0	4.0-16.0	1-6
	8-22	2.0-6.0	7.9-8.4	1-5	0	4.0-16.0	1-6
	22-80	2.0-6.0	7.9-8.4	1-5	0	4.0-16.0	1-6
<b>GmrA:</b>							
Gracemont-----	0-7	6.0-11	6.6-8.4	0-5	0	0.0-4.0	0-2
	7-29	6.0-11	7.9-8.4	1-10	0	0.0-4.0	0-2
	29-45	6.0-17	7.9-8.4	1-10	0	0.0-4.0	0-2
	45-80	6.0-17	7.9-8.4	1-10	0	0.0-4.0	0-2
<b>GmsA:</b>							
Gracemont-----	0-7	6.0-11	6.6-8.4	1-10	0	4.0-16.0	1-6
	7-22	6.0-11	7.9-8.4	1-5	0	4.0-16.0	1-6
	22-31	6.0-17	7.9-8.4	1-5	0	4.0-16.0	1-6
	31-62	6.0-17	7.9-8.4	1-5	0	4.0-16.0	1-6
	62-80	6.0-17	7.9-8.4	1-5	0	4.0-16.0	1-6
<b>GrmA:</b>							
Gracemore-----	0-13	9.0-17	7.4-8.4	1-10	0	4.0-16.0	1-6
	13-20	2.0-6.0	7.9-8.4	1-5	0	4.0-16.0	1-6
	20-30	2.0-6.0	7.9-8.4	1-5	0	4.0-16.0	1-6
	30-49	16-19	7.9-8.4	0-5	0	4.0-16.0	1-6
	49-80	2.0-6.0	7.9-8.4	1-5	0	4.0-16.0	1-6

Table 21.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
<b>HdGB:</b>							
Hardeman-----	0-7	5.0-10	7.4-8.4	0	0	0.0-2.0	0
	7-18	5.0-10	7.4-8.4	0	0	0.0-2.0	0
	18-37	5.0-10	7.4-8.4	1-10	0	0.0-2.0	0
	37-47	5.0-10	7.4-8.4	1-10	0	0.0-2.0	0
	47-106	5.0-10	7.4-8.4	0-5	0	0.0-2.0	0
Grandmore-----	0-18	6.0-11	6.6-8.4	0	0	0	0
	18-27	11-18	7.4-8.4	0	0	0	0
	27-49	11-18	7.4-8.4	0	0	0	0
	49-60	11-18	7.4-8.4	0	0	0	0
	60-80	18-27	7.4-8.4	0	0	0	0
<b>HdGC:</b>							
Hardeman-----	0-6	5.0-10	7.4-8.4	0	0	0.0-2.0	0
	6-13	5.0-10	7.4-8.4	0	0	0.0-2.0	0
	13-24	5.0-10	7.4-8.4	1-10	0	0.0-2.0	0
	24-48	5.0-10	7.4-8.4	1-10	0	0.0-2.0	0
	48-80	5.0-10	7.4-8.4	0-5	0	0.0-2.0	0
Grandmore-----	0-15	6.0-11	6.6-8.4	0	0	0	0
	15-30	11-18	7.4-8.4	0	0	0	0
	30-54	18-27	7.4-8.4	0	0	0	0
	54-70	18-27	7.4-8.4	0	0	0	0
	70-80	11-18	7.4-8.4	0	0	0	0
<b>HdmB:</b>							
Hardeman-----	0-9	5.0-10	7.4-8.4	0	0	0.0-2.0	0
	9-24	5.0-10	7.4-8.4	0	0	0.0-2.0	0
	24-42	5.0-10	7.4-8.4	1-10	0	0.0-2.0	0
	42-53	5.0-10	7.4-8.4	1-10	0	0.0-2.0	0
	53-80	5.0-10	7.4-8.4	0-5	0	0.0-2.0	0
<b>HdmC:</b>							
Hardeman-----	0-9	5.0-10	7.4-8.4	0	0	0.0-2.0	0
	9-27	5.0-10	7.4-8.4	0	0	0.0-2.0	0
	27-34	5.0-10	7.4-8.4	1-10	0	0.0-2.0	0
	34-59	5.0-10	7.4-8.4	1-10	0	0.0-2.0	0
	59-80	5.0-10	7.4-8.4	0-5	0	0.0-2.0	0
<b>IreA:</b>							
Irene-----	0-8	10-16	6.6-8.4	0	0	0	0
	8-14	16-21	6.6-8.4	0-2	0	0	0
	14-23	16-21	7.9-8.4	1-5	0	0	0
	23-49	16-21	7.9-8.4	1-15	0	0	0
	49-80	10-18	7.9-8.4	5-15	0	0	0
<b>IreB:</b>							
Irene-----	0-9	10-16	6.6-8.4	0	0	0	0
	9-14	16-21	6.6-8.4	0-2	0	0	0
	14-29	16-21	7.9-8.4	1-5	0	0	0
	29-44	16-21	7.9-8.4	1-15	0	0	0
	44-80	16-21	7.9-8.4	1-15	0	0	0
<b>IreC:</b>							
Irene-----	0-15	10-16	6.6-8.4	0	0	0	0
	15-23	16-21	6.6-8.4	0-2	0	0	0
	23-46	16-21	7.9-8.4	1-5	0	0	0
	46-59	16-21	7.9-8.4	1-15	0	0	0
	59-80	10-18	7.9-8.4	5-15	0	0	0

Table 21.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
IreD:							
Irene-----	0-11	10-16	6.6-8.4	0	0	0	0
	11-22	16-21	6.6-8.4	0-2	0	0	0
	22-36	16-21	7.9-8.4	1-5	0	0	0
	36-51	16-21	7.9-8.4	1-15	0	0	0
	51-80	10-18	7.9-8.4	5-15	0	0	0
JssF:							
Jester-----	0-5	1.5-7.0	6.6-8.4	0-2	0	0	0
	5-16	1.5-7.0	7.4-8.4	0-2	0	0	0
	16-42	1.5-7.0	7.4-8.4	0-2	0	0	0
	42-57	1.5-7.0	7.4-8.4	0-2	0	0	0
	57-80	1.5-7.0	7.4-8.4	0-2	0	0	0
JstC:							
Jester-----	0-7	1.5-7.0	6.6-8.4	0-2	0	0	0
	7-40	1.5-7.0	7.4-8.4	0-2	0	0	0
	40-80	1.5-7.0	7.4-8.4	0-2	0	0	0
KidB:							
Kingsdown-----	0-14	3.0-12	6.6-8.4	1-2	---	---	---
	14-23	3.0-11	7.4-8.4	1-5	---	---	---
	23-32	3.0-11	7.4-8.4	1-5	---	---	---
	32-43	3.0-11	7.4-8.4	1-5	---	---	---
	43-80	2.0-11	7.4-8.4	1-2	---	---	---
KiHE:							
Kingsdown-----	0-10	3.0-12	6.6-8.4	1-2	---	---	---
	10-25	2.0-11	7.4-8.4	1-5	---	---	---
	25-38	2.0-11	7.4-8.4	1-5	---	---	---
	38-80	3.0-11	7.4-8.4	1-2	---	---	---
Hardeman-----	0-6	5.0-10	7.4-8.4	0-1	0	0.0-2.0	0
	6-16	5.0-10	7.4-8.4	2-8	0	0.0-2.0	0
	16-39	5.0-10	7.4-8.4	1-2	0	0.0-2.0	0
	39-80	5.0-10	7.4-8.4	0-1	0	0.0-2.0	0
LgtA:							
Lugert-----	0-11	6.0-11	6.6-7.8	0	0	0	0
	11-36	6.0-11	7.4-8.4	0-1	0	0	0
	36-48	6.0-11	7.4-8.4	0-1	0	0.0-2.0	0
	48-69	6.0-11	7.4-8.4	0-1	0	0.0-2.0	0
	69-88	6.0-11	7.4-8.4	0-1	0	0.0-2.0	0
LiJC:							
Lincoln-----	0-11	7.0-12	7.4-8.4	0-5	0	0	0
	11-19	4.0-10	7.9-8.4	0-5	0	0	0
	19-80	4.0-10	7.9-8.4	0-5	0	0	0
Jester-----	0-6	1.5-7.0	6.6-8.4	0-2	0	0	0
	6-19	1.5-7.0	7.4-8.4	0-2	0	0	0
	19-30	1.5-7.0	7.4-8.4	0-2	0	0	0
	30-80	1.5-7.0	7.4-8.4	0-2	0	0	0
LikB:							
Likes-----	0-7	2.0-10	7.4-8.4	2-15	0	0.0-2.0	0
	7-16	2.0-10	7.9-8.4	2-15	0	0.0-2.0	0
	16-28	2.0-10	7.9-8.4	2-15	0	0.0-2.0	0
	28-42	2.0-10	7.9-8.4	2-15	0	0.0-2.0	0
	42-80	2.0-10	7.9-8.4	2-15	0	0.0-2.0	0

Table 21.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
LisA:							
Lincoln-----	0-4	7.0-12	7.4-8.4	0-5	0	0	0
	4-10	4.0-10	7.9-8.4	0-5	0	0	0
	10-80	4.0-10	7.9-8.4	0-5	0	0	0
LncA:							
Lincoln-----	0-8	16-18	7.4-8.4	0	0	0	0
	8-19	3.0-9.0	7.9-8.4	0	0	0	0
	19-28	3.0-9.0	7.9-8.4	0	0	0	0
	28-34	3.0-9.0	7.9-8.4	0	0	0	0
	34-80	3.0-9.0	7.9-8.4	0	0	0	0
LROE:							
Laverne-----	0-8	10-30	7.9-8.4	10-40	0	0.0-2.0	0
	8-15	5.0-10	7.9-8.4	40-80	0	0.0-2.0	0
	15-25	---	---	---	---	0.0-2.0	---
Rock outcrop-----	0-24	---	---	---	---	---	---
LshA:							
Lesho-----	0-11	15-25	7.4-8.4	1-5	0	0.0-4.0	0-2
	11-17	10-25	7.4-8.4	1-5	0	0.0-4.0	0-2
	17-23	10-25	7.4-8.4	1-5	0	0.0-4.0	0-2
	23-34	10-25	7.4-8.4	1-5	0	0.0-4.0	0-2
	34-80	1.0-5.0	7.4-8.4	1-5	0	0.0-4.0	0-2
LsoA:							
Lincoln-----	0-7	7.0-12	7.4-8.4	0-5	0	0	0
	7-20	4.0-10	7.9-8.4	0-5	0	0	0
	20-31	4.0-10	7.9-8.4	0-5	0	0	0
	31-48	4.0-10	7.9-8.4	0-5	0	0	0
	48-80	4.0-10	7.9-8.4	0-5	0	0	0
M-W:							
Water-----	0-80	---	---	---	---	---	---
MLBB:							
Mobeetie-----	0-6	5.0-15	7.9-8.4	0-10	0	0	0
	6-11	5.0-15	7.9-8.4	5-15	0	0	0
	11-21	5.0-15	7.9-8.4	5-15	0	0	0
	21-34	5.0-15	7.9-8.4	5-15	0	0	0
	34-80	5.0-15	7.9-8.4	5-15	0	0	0
Likes-----	0-5	2.0-10	7.4-8.4	2-15	0	0.0-2.0	0
	5-11	2.0-10	7.9-8.4	2-15	0	0.0-2.0	0
	11-80	2.0-10	7.9-8.4	2-15	0	0.0-2.0	0
Berda-----	0-8	5.0-10	7.9-8.4	1-5	0	0.0-2.0	0
	8-15	10-15	7.9-8.4	1-20	0	0.0-2.0	0
	15-28	10-15	7.9-8.4	1-20	0	0.0-2.0	0
	28-34	10-15	7.9-8.4	1-20	0	0.0-2.0	0
	34-80	10-15	7.9-8.4	1-20	0	0.0-2.0	0
MLBC:							
Mobeetie-----	0-6	5.0-15	7.9-8.4	0-10	0	0	0
	6-19	5.0-15	7.9-8.4	5-15	0	0	0
	19-25	5.0-15	7.9-8.4	5-15	0	0	0
	25-36	5.0-15	7.9-8.4	5-15	0	0	0
	36-80	5.0-15	7.9-8.4	5-15	0	0	0

Table 21.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
<b>MLBC:</b>							
Likes-----	0-7	2.0-10	7.4-8.4	2-15	0	0.0-2.0	0
	7-18	2.0-10	7.9-8.4	2-15	0	0.0-2.0	0
	18-80	2.0-10	7.9-8.4	2-15	0	0.0-2.0	0
Berda-----	0-6	5.0-10	7.9-8.4	1-5	0	0.0-2.0	0
	6-15	10-15	7.9-8.4	1-20	0	0.0-2.0	0
	15-27	10-15	7.9-8.4	1-20	0	0.0-2.0	0
	27-34	10-15	7.9-8.4	1-20	0	0.0-2.0	0
	34-80	10-15	7.9-8.4	1-20	0	0.0-2.0	0
<b>MLBE:</b>							
Mobeetie-----	0-5	5.0-15	7.9-8.4	0-10	0	0	0
	5-12	5.0-15	7.9-8.4	5-15	0	0	0
	12-23	5.0-15	7.9-8.4	5-15	0	0	0
	23-39	5.0-15	7.9-8.4	5-15	0	0	0
	39-80	5.0-15	7.9-8.4	5-15	0	0	0
Likes-----	0-6	2.0-10	7.4-8.4	2-15	0	0.0-2.0	0
	6-11	2.0-10	7.9-8.4	2-15	0	0.0-2.0	0
	11-27	2.0-10	7.9-8.4	2-15	0	0.0-2.0	0
	27-80	2.0-10	7.9-8.4	2-15	0	0.0-2.0	0
Berda-----	0-5	5.0-10	7.9-8.4	1-5	0	0.0-2.0	0
	5-12	10-15	7.9-8.4	1-20	0	0.0-2.0	0
	12-29	10-15	7.9-8.4	1-20	0	0.0-2.0	0
	29-39	10-15	7.9-8.4	1-20	0	0.0-2.0	0
	39-80	10-15	7.9-8.4	1-20	0	0.0-2.0	0
<b>MnsB:</b>							
Mansic-----	0-14	15-25	7.4-8.4	5-10	0	0	0
	14-23	10-25	7.4-8.4	15-25	0	0	0
	23-35	10-25	7.4-8.4	15-25	0	0	0
	35-40	10-25	7.4-8.4	15-25	0	0	0
	40-80	10-25	7.4-8.4	15-25	0	0	0
<b>MnsC:</b>							
Mansic-----	0-7	15-25	7.4-8.4	5-10	0	0	0
	7-21	10-25	7.4-8.4	15-25	0	0	0
	21-36	10-25	7.4-8.4	15-25	0	0	0
	36-80	10-25	7.4-8.4	15-25	0	0	0
<b>MsnB:</b>							
Manson-----	0-7	7.0-15	7.9-8.4	5-15	0	0.0-2.0	0
	7-13	10-15	7.9-8.4	10-40	0	0.0-2.0	0
	13-23	10-15	7.9-8.4	10-40	0	0.0-2.0	0
	23-41	10-15	7.9-8.4	10-40	0	0.0-2.0	0
	41-80	10-15	7.9-8.4	10-40	0	0.0-2.0	0
<b>MsnC:</b>							
Manson-----	0-11	7.0-15	7.9-8.4	5-15	0	0.0-2.0	0
	11-19	10-15	7.9-8.4	10-40	0	0.0-2.0	0
	19-35	10-15	7.9-8.4	10-40	0	0.0-2.0	0
	35-66	10-15	7.9-8.4	10-40	0	0.0-2.0	0
	66-80	10-15	7.9-8.4	10-40	0	0.0-2.0	0

Table 21.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
<b>MsnC2:</b>							
Manson-----	0-12	7.0-15	7.9-8.4	5-15	0	0.0-2.0	0
	12-30	10-15	7.9-8.4	10-40	0	0.0-2.0	0
	30-44	10-15	7.9-8.4	10-40	0	0.0-2.0	0
	44-55	10-15	7.9-8.4	10-40	0	0.0-2.0	0
	55-80	10-15	7.9-8.4	10-40	0	0.0-2.0	0
<b>OMBE:</b>							
Okark-----	0-10	16-18	7.4-8.4	5-10	0	0	0
	10-28	6.0-11	7.4-8.4	5-40	0	0	0
	28-41	4.0-11	7.9-8.4	15-40	0	0	0
	41-80	4.0-11	7.9-8.4	15-40	0	0	0
<b>Mansic-----</b>	0-12	16-21	7.4-8.4	5-10	0	0	0
	12-28	11-21	7.4-8.4	15-40	0	0	0
	28-56	11-21	7.4-8.4	15-40	0	0	0
	56-80	7.0-21	7.4-8.4	5-40	0	0	0
<b>Berda-----</b>	0-9	8.0-13	7.4-8.4	0-5	0	0	0
	9-27	9.0-17	7.4-8.4	15-25	0	0	0
	27-47	9.0-17	7.4-8.4	15-25	0	0	0
	47-80	9.0-17	7.4-8.4	15-25	0	0	0
<b>OMBG:</b>							
Okark-----	0-10	4.0-11	7.4-8.4	5-10	0	0	0
	10-21	6.0-11	7.4-8.4	5-40	0	0	0
	21-80	4.0-11	7.9-8.4	15-40	0	0	0
<b>Mansic-----</b>	0-12	10-17	7.4-8.4	5-10	0	0	0
	12-21	11-21	7.4-8.4	15-40	0	0	0
	21-39	11-21	7.4-8.4	15-40	0	0	0
	39-80	7.0-21	7.4-8.4	5-40	0	0	0
<b>Berda-----</b>	0-7	8.0-15	7.9-8.4	1-5	0	0.0-2.0	0
	7-22	10-15	7.9-8.4	1-20	0	0.0-2.0	0
	22-47	10-15	7.9-8.4	1-20	0	0.0-2.0	0
	47-80	10-15	7.9-8.4	1-20	0	0.0-2.0	0
<b>PdoA:</b>							
Paloduro-----	0-9	15-20	7.9-8.4	0-5	0	0.0-2.0	0
	9-14	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	14-27	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	27-80	10-15	7.9-8.4	0-10	0	0.0-2.0	0
<b>PdoB:</b>							
Paloduro-----	0-10	10-15	7.9-8.4	0-5	0	0.0-2.0	0
	10-20	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	20-35	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	35-44	10-15	7.9-8.4	0-5	0	0.0-2.0	0
	44-80	10-15	7.9-8.4	5-15	0	0.0-2.0	0
<b>PdoC2:</b>							
Paloduro-----	0-10	15-20	7.9-8.4	0-5	0	0.0-2.0	0
	10-25	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	25-49	10-15	7.9-8.4	5-15	0	0.0-2.0	0
	49-80	10-15	7.9-8.4	5-15	0	0.0-2.0	0
<b>PIT:</b>							
Pits-----	0-60	---	---	---	---	---	---

Table 21.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
PlmB:							
Plemons-----	0-8	7.0-15	7.9-8.4	5-15	0	0.0-2.0	0
	8-21	10-15	7.9-8.4	10-25	0	0.0-2.0	0
	21-46	10-15	7.9-8.4	10-40	0	0.0-2.0	0
	46-80	10-15	7.9-8.4	10-40	0	0.0-2.0	0
PlmC:							
Plemons-----	0-8	7.0-15	7.9-8.4	5-15	0	0.0-2.0	0
	8-18	10-15	7.9-8.4	10-25	0	0.0-2.0	0
	18-42	10-15	7.9-8.4	10-40	0	0.0-2.0	0
	42-60	10-15	7.9-8.4	10-40	0	0.0-2.0	0
	60-80	10-15	7.9-8.4	10-40	0	0.0-2.0	0
PlmD:							
Plemons-----	0-8	7.0-15	7.9-8.4	5-15	0	0.0-2.0	0
	8-19	10-15	7.9-8.4	10-25	0	0.0-2.0	0
	19-37	10-15	7.9-8.4	10-40	0	0.0-2.0	0
	37-60	10-15	7.9-8.4	10-40	0	0.0-2.0	0
	60-80	10-15	7.9-8.4	10-40	0	0.0-2.0	0
QnWC3:							
Quinlan-----	0-13	7.0-18	7.4-8.4	0-15	0-2	0	0
	13-18	---	---	---	---	---	---
Woodward-----	0-3	7.0-11	6.6-8.4	0-10	0	0	0
	3-30	7.0-11	7.4-8.4	2-15	0	0	0
	30-35	---	---	---	---	---	---
QnWD:							
Quinlan-----	0-6	10-17	7.4-8.4	0-10	0	0	0
	6-15	7.0-18	7.4-8.4	0-15	0-2	0	0
	15-24	---	---	---	---	---	---
Woodward-----	0-8	7.0-11	6.6-8.4	0-10	0	0	0
	8-18	7.0-11	7.4-8.4	2-15	0	0	0
	18-25	7.0-11	7.4-8.4	2-15	0	0	0
	25-29	---	---	---	---	---	---
QnWE:							
Quinlan-----	0-6	10-17	7.4-8.4	0-10	0	0	0
	6-14	7.0-18	7.4-8.4	0-15	0-2	0	0
	14-18	7.0-18	7.4-8.4	0-15	0-2	0	0
	18-22	---	---	---	---	---	---
Woodward-----	0-4	7.0-11	6.6-8.4	0-10	0	0	0
	4-16	7.0-11	7.4-8.4	2-15	0	0	0
	16-22	7.0-11	7.4-8.4	2-15	0	0	0
	22-26	---	---	---	---	---	---
QRWG:							
Quinlan-----	0-8	10-17	7.4-8.4	0-10	0	0	0
	8-13	7.0-18	7.4-8.4	0-15	0-2	0	0
	13-18	---	---	---	---	---	---
Rock outcrop-----	0-60	---	---	---	---	---	---
Woodward-----	0-6	7.0-11	6.6-8.4	0-10	0	0	0
	6-14	7.0-11	7.4-8.4	2-15	0	0	0
	14-22	7.0-11	7.4-8.4	2-15	0	0	0
	22-25	---	---	---	---	---	---

Table 21.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
QRYG:							
Quinlan-----	0-8	10-17	7.4-8.4	0-10	0	0	0
	8-14	7.0-18	7.4-8.4	0-15	0-2	0	0
	14-18	---	---	---	---	---	---
Rock outcrop-----	0-60	---	---	---	---	---	---
Yomont-----	0-11	5.0-10	7.9-8.4	2-10	0	0.0-2.0	0
	11-22	5.0-10	7.9-8.4	2-10	0	0.0-2.0	0
	22-38	5.0-10	7.9-8.4	2-10	0	0.0-2.0	0
	38-52	5.0-10	7.9-8.4	2-10	0	0.0-2.0	0
	52-80	5.0-10	7.9-8.4	2-10	0	0.0-2.0	0
QWDE:							
Quinlan-----	0-6	7.0-11	7.4-8.4	0-10	0	0	0
	6-9	7.0-18	7.4-8.4	0-15	0-2	0	0
	9-16	7.0-18	7.4-8.4	0-15	0-2	0	0
	16-43	---	---	---	---	---	---
Woodward-----	0-10	7.0-11	6.6-8.4	0-10	0	0	0
	10-17	7.0-11	7.4-8.4	2-15	0	0	0
	17-25	7.0-11	7.4-8.4	2-15	0	0	0
	25-27	---	---	---	---	---	---
Deepwood-----	0-12	7.0-11	6.6-8.4	0-5	0	0	0
	12-28	7.0-11	7.4-8.4	1-15	0	0	0
	28-80	7.0-11	7.4-8.4	1-15	0	0	0
	80-92	7.0-11	7.4-8.4	1-10	0	0	0
	92-106	7.0-11	7.4-8.4	1-10	0	0	0
QWRC:							
Quinlan-----	0-6	7.0-11	7.4-8.4	0-10	0	0	0
	6-14	7.0-18	7.4-8.4	0-15	0-2	0	0
	14-18	---	---	---	---	---	---
Woodward-----	0-6	7.0-11	6.6-8.4	0-10	0	0	0
	6-18	7.0-11	7.4-8.4	2-15	0	0	0
	18-28	7.0-11	7.4-8.4	2-15	0	0	0
	28-38	7.0-11	7.4-8.4	2-15	0	0	0
	38-42	---	---	---	---	---	---
Rock outcrop-----	0-60	---	---	---	---	---	---
RoCH:							
Rock outcrop-----	0-60	---	---	---	40-90	8.0-16.0	---
Cottonwood-----	0-9	10-15	7.9-8.4	5-30	5-40	0	0
	9-13	---	---	---	---	---	---
RssA:							
Rosston-----	0-13	50-60	7.4-8.4	0-3	0	0.0-2.0	0
	13-31	50-60	7.4-8.4	0-5	0	0.0-2.0	0
	31-51	50-60	7.9-8.4	5-15	0	0.0-2.0	0
	51-80	40-60	7.9-8.4	5-15	0	0.0-2.0	0
SAL:							
Salt flats-----	0-14	2.0-7.0	7.4-8.4	0-1	0-1	16.0-30.0	12-20
	14-40	2.0-23	7.9-8.4	0-5	0-5	16.0-30.0	12-20
	40-80	2.0-7.0	7.9-8.4	0-1	0-1	16.0-30.0	12-20



Table 21.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
<b>SelA:</b>							
Selman-----	0-15	7.0-15	5.6-8.4	0-5	0	0	0
	15-25	7.0-15	5.6-8.4	0-5	0	0	0
	25-38	12-21	7.9-8.4	3-14	0	0	0
	38-55	12-21	7.9-8.4	3-14	0	0	0
	55-80	4.0-17	7.9-8.4	3-12	0-3	0	0
<b>SelB:</b>							
Selman-----	0-5	7.0-15	5.6-8.4	0-5	0	0	0
	5-16	7.0-15	5.6-8.4	0-5	0	0	0
	16-51	12-21	7.9-8.4	3-14	0	0	0
	51-61	12-21	7.9-8.4	3-14	0	0	0
	61-80	4.0-17	7.9-8.4	3-12	0	0	0
<b>SelC:</b>							
Selman-----	0-8	7.0-15	5.6-8.4	0-5	0	0	0
	8-14	7.0-15	5.6-8.4	0-5	0	0	0
	14-27	12-21	7.9-8.4	3-14	0	0	0
	27-56	12-21	7.9-8.4	3-14	0	0	0
	56-80	4.0-17	7.9-8.4	3-12	0	0	0
<b>SelC2:</b>							
Selman-----	0-6	7.0-15	5.6-8.4	0-5	0	0	0
	6-18	7.0-15	5.6-8.4	0-5	0	0	0
	18-31	12-21	7.9-8.4	3-14	0	0	0
	31-54	12-21	7.9-8.4	3-14	0	0	0
	54-80	4.0-17	7.9-8.4	3-12	0	0	0
<b>SelD:</b>							
Selman-----	0-9	7.0-15	5.6-8.4	0-5	0	0	0
	9-16	7.0-15	5.6-8.4	0-5	0	0	0
	16-61	12-21	7.9-8.4	3-14	0	0	0
	61-80	4.0-17	7.9-8.4	3-12	0	0	0
<b>SelD2:</b>							
Selman-----	0-7	7.0-15	5.6-8.4	0-5	0	0	0
	7-24	12-21	7.9-8.4	3-14	0	0	0
	24-43	12-21	7.9-8.4	3-14	0	0	0
	43-80	4.0-17	7.9-8.4	3-12	0	0	0
<b>SprA:</b>							
Spur-----	0-12	10-20	7.9-8.4	0-2	0	0.0-2.0	0
	12-21	10-20	7.9-8.4	2-10	0	0.0-2.0	0
	21-39	10-20	7.9-8.4	2-10	0	0.0-2.0	0
	39-80	10-20	7.9-8.4	2-10	0	0.0-2.0	0
<b>SpsA:</b>							
Spur-----	0-18	10-20	7.9-8.4	0-2	0	4.0-8.0	0-2
	18-35	10-20	7.9-8.4	2-10	0	4.0-8.0	0-2
	35-57	10-20	7.9-8.4	2-10	0	4.0-8.0	0-2
	57-80	10-20	7.9-8.4	2-10	0	4.0-8.0	0-2
<b>StpA:</b>							
St. Paul-----	0-13	9.0-16	6.6-7.8	0	0	0	0
	13-22	16-21	7.4-8.4	0-5	0	0	0
	22-66	16-24	7.4-8.4	0-5	0	0	0
	66-77	12-24	7.4-8.4	1-10	0	0	0
	77-88	9.0-21	7.9-8.4	1-10	0	0	0

Table 21.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
StpB:							
St. Paul-----	0-13	9.0-16	6.6-7.8	0	0	0	0
	13-20	16-21	7.4-8.4	0-5	0	0	0
	20-31	16-24	7.4-8.4	0-5	0	0	0
	31-45	12-24	7.4-8.4	1-10	0	0	0
	45-86	9.0-21	7.9-8.4	1-10	0	0	0
StpC:							
St. Paul-----	0-11	9.0-16	6.6-7.8	0	0	0	0
	11-20	11-21	6.6-7.8	0	0	0	0
	20-33	16-21	7.4-8.4	0-5	0	0	0
	33-51	16-24	7.4-8.4	0-5	0	0	0
	51-80	12-24	7.4-8.4	1-10	0	0	0
StpD:							
St. Paul-----	0-9	9.0-16	6.6-7.8	0	0	0	0
	9-22	16-21	7.4-8.4	0-5	0	0	0
	22-42	16-24	7.4-8.4	0-5	0	0	0
	42-61	12-24	7.4-8.4	1-10	0	0	0
	61-80	9.0-21	7.9-8.4	1-10	0	0	0
TeWE:							
Teagard-----	0-9	19-24	7.4-8.4	0-5	0	0	0
	9-18	24-48	7.9-8.4	2-10	0	0	0
	18-30	24-48	7.9-8.4	2-10	0	0	0
	30-38	24-48	7.9-8.4	2-10	0	0	0
	38-40	---	---	---	---	---	---
Wellsford-----	0-7	15-30	6.6-8.4	0-5	0	0.0-2.0	2-8
	7-16	15-40	7.9-8.4	2-10	0	0.0-2.0	2-8
	16-20	---	---	0	---	0	0
TexA:							
Texroy-----	0-13	7.0-14	6.6-8.4	0-2	0	0.0-2.0	0
	13-24	11-18	7.4-8.4	0-10	0	0.0-2.0	0
	24-37	11-18	7.4-8.4	0-10	0	0.0-2.0	0
	37-63	11-18	7.4-8.4	0-10	0	0.0-2.0	0
	63-80	10-20	7.4-8.4	0-10	0	0.0-2.0	0
TexB:							
Texroy-----	0-11	7.0-14	6.6-8.4	0-2	0	0.0-2.0	0
	11-23	11-18	7.4-8.4	0-10	0	0.0-2.0	0
	23-42	11-18	7.4-8.4	0-10	0	0.0-2.0	0
	42-64	11-18	7.4-8.4	0-10	0	0.0-2.0	0
	64-80	10-20	7.4-8.4	0-10	0	0.0-2.0	0
TexC:							
Texroy-----	0-12	7.0-14	6.6-8.4	0-2	0	0.0-2.0	0
	12-20	11-18	7.4-8.4	0-10	0	0.0-2.0	0
	20-35	11-18	7.4-8.4	0-10	0	0.0-2.0	0
	35-51	11-18	7.4-8.4	0-10	0	0.0-2.0	0
	51-80	10-20	7.4-8.4	0-10	0	0.0-2.0	0
TipA:							
Tipton-----	0-10	9.0-12	6.6-7.8	0	0	0	0
	10-21	12-19	6.6-8.4	0	0	0	0
	21-45	12-19	6.6-8.4	0	0	0	0
	45-62	12-19	6.6-8.4	0	0	0	0
	62-80	12-19	6.6-8.4	0	0	0	0

Table 21.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
TipB:							
Tipton-----	0-8	9.0-12	6.6-7.8	0	0	0	0
	8-26	12-19	6.6-8.4	0	0	0	0
	26-38	12-19	6.6-8.4	0	0	0	0
	38-55	12-19	6.6-8.4	0	0	0	0
	55-80	12-19	6.6-8.4	0	0	0	0
TipC:							
Tipton-----	0-23	9.0-12	6.6-7.8	0	0	0	0
	23-35	12-19	6.6-8.4	0	0	0	0
	35-49	12-19	6.6-8.4	0	0	0	0
	49-72	12-19	6.6-8.4	0	0	0	0
	72-80	12-19	6.6-8.4	0	0	0	0
TipD:							
Tipton-----	0-17	9.0-12	6.6-7.8	0	0	0	0
	17-22	9.0-12	6.6-7.8	0	0	0	0
	22-50	12-19	6.6-8.4	0	0	0	0
	50-70	12-19	6.6-8.4	0	0	0	0
	70-80	12-19	6.6-8.4	0	0	0	0
TRQC:							
Talpa-----	0-12	5.0-20	7.9-8.4	10-40	0	0	0
	12-14	---	---	---	---	---	---
Rock outcrop-----	0-14	---	---	---	---	---	---
Quinlan-----	0-8	10-17	7.4-8.4	0-10	0	0	0
	8-14	7.0-18	7.4-8.4	0-15	0-2	0	0
	14-20	---	---	---	---	---	---
TvlC:							
Tivoli-----	0-7	3.0-6.0	6.1-7.8	0	0	0	0
	7-80	1.0-6.0	6.1-8.4	0	0	0	0
TvlE:							
Tivoli-----	0-13	3.0-6.0	6.1-7.8	0	0	0	0
	13-20	1.0-6.0	6.1-8.4	0	0	0	0
	20-80	1.0-6.0	6.1-8.4	0	0	0	0
TvlG:							
Tivoli-----	0-8	3.0-6.0	6.1-7.8	0	0	0	0
	8-18	1.0-6.0	6.1-8.4	0	0	0	0
	18-40	1.0-6.0	6.1-8.4	0	0	0	0
	40-80	1.0-6.0	6.1-8.4	0	0	0	0
VerB:							
Vernon-----	0-5	15-25	7.9-8.4	0-15	0	0.0-2.0	0-2
	5-11	20-35	7.9-8.4	5-35	0-2	0.0-2.0	2-15
	11-22	20-35	7.9-8.4	5-35	0-2	0.0-2.0	2-15
	22-34	20-35	7.9-8.4	5-35	0-2	0.0-2.0	2-15
	34-39	---	---	---	---	---	---
VerC:							
Vernon-----	0-6	15-25	7.9-8.4	0-15	0	0.0-2.0	0-2
	6-35	20-35	7.9-8.4	5-35	0-2	0.0-2.0	2-15
	35-39	---	---	---	---	---	---

Table 21.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
VerD:							
Vernon-----	0-5	15-25	7.9-8.4	0-15	0	0.0-2.0	0-2
	5-13	20-35	7.9-8.4	5-35	0-2	0.0-2.0	2-15
	13-26	20-35	7.9-8.4	5-35	0-2	0.0-2.0	2-15
	26-39	---	---	---	---	---	---
VrrB:							
Vernon-----	0-4	2.0-10	7.4-8.4	1-5	0	0.0-2.0	0
	4-10	10-20	7.4-8.4	1-5	0	0.0-2.0	0
	10-31	20-30	7.9-8.4	1-20	0-2	0.0-2.0	0
	31-39	20-30	7.9-8.4	1-20	0-2	0.0-2.0	0
	39-47	---	---	---	---	---	---
VrrC:							
Vernon-----	0-16	2.0-10	7.4-8.4	1-5	0	0.0-2.0	0
	16-22	10-20	7.4-8.4	1-5	0	0.0-2.0	0
	22-31	20-30	7.9-8.4	1-20	0-2	0.0-2.0	0
	31-37	20-30	7.9-8.4	1-20	0-2	0.0-2.0	0
	37-41	---	---	---	---	---	---
W:							
Water-----	0-80	---	---	---	---	---	---
WodA:							
Woods-----	0-16	11-24	7.9-8.4	0-5	0	0.0-2.0	0
	16-26	21-36	7.9-8.4	5-15	0	0.0-2.0	0
	26-42	17-36	7.9-8.4	15-40	0	0.0-2.0	0
	42-62	17-36	7.9-8.4	15-40	0	0.0-2.0	0
	62-80	11-36	7.9-8.4	5-20	0	0.0-2.0	0
WodB:							
Woods-----	0-11	11-24	7.9-8.4	0-5	0	0.0-2.0	0
	11-26	21-36	7.9-8.4	5-15	0	0.0-2.0	0
	26-41	17-36	7.9-8.4	15-40	0	0.0-2.0	0
	41-60	17-36	7.9-8.4	15-40	0	0.0-2.0	0
	60-80	11-36	7.9-8.4	5-20	0	0.0-2.0	0
WodC:							
Woods-----	0-10	11-24	7.9-8.4	0-5	0	0.0-2.0	0
	10-13	11-24	7.9-8.4	0-5	0	0.0-2.0	0
	13-51	21-36	7.9-8.4	5-15	0	0.0-2.0	0
	51-69	17-36	7.9-8.4	15-40	0	0.0-2.0	0
	69-80	11-36	7.9-8.4	5-20	0	0.0-2.0	0
WQHE:							
Westola-----	0-11	7.0-11	7.4-8.4	1-5	0	0	0
	11-18	4.0-11	7.9-8.4	1-10	0	0	0
	18-28	4.0-11	7.9-8.4	1-10	0	0	0
	28-34	4.0-11	7.9-8.4	1-10	0	0	0
	34-80	4.0-11	7.9-8.4	1-10	0	0	0
Quinlan-----	0-8	10-17	7.4-8.4	0-10	0	0	0
	8-15	7.0-18	7.4-8.4	0-15	0-2	0	0
	15-18	---	---	---	---	---	---
Hardeman-----	0-9	5.0-10	7.4-8.4	0	0	0.0-2.0	0
	9-18	5.0-10	7.4-8.4	0	0	0.0-2.0	0
	18-35	5.0-10	7.4-8.4	0	0	0.0-2.0	0
	35-47	5.0-10	7.4-8.4	0	0	0.0-2.0	0
	47-80	5.0-10	7.4-8.4	0	0	0.0-2.0	0

Table 21.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
WQnB:							
Woodward-----	0-8	7.0-11	6.6-8.4	0-10	0	0	0
	8-19	7.0-11	7.4-8.4	2-15	0	0	0
	19-25	7.0-11	7.4-8.4	2-15	0	0	0
	25-30	---	---	---	---	---	---
Quinlan-----	0-6	10-17	7.4-8.4	0-10	0	0	0
	6-18	7.0-18	7.4-8.4	0-15	0-2	0	0
	18-22	---	---	---	---	---	---
WQnC:							
Woodward-----	0-7	7.0-11	6.6-8.4	0-10	0	0	0
	7-30	7.0-11	7.4-8.4	2-15	0	0	0
	30-35	---	---	---	---	---	---
Quinlan-----	0-8	10-17	7.4-8.4	0-10	0	0	0
	8-13	7.0-18	7.4-8.4	0-15	0-2	0	0
	13-18	---	---	---	---	---	---
WslA:							
Westola-----	0-8	7.0-11	7.4-8.4	1-5	0	0	0
	8-16	4.0-11	7.9-8.4	1-10	0	0	0
	16-27	4.0-11	7.9-8.4	1-10	0	0	0
	27-33	4.0-11	7.9-8.4	1-10	0	0	0
	33-80	4.0-11	7.9-8.4	1-10	0	0	0
WstA:							
Westola-----	0-10	7.0-11	7.4-8.4	1-5	0	0	0
	10-25	4.0-11	7.9-8.4	1-10	0	0	0
	25-43	4.0-11	7.9-8.4	1-10	0	0	0
	43-90	4.0-11	7.9-8.4	1-10	0	0	0
	90-99	4.0-11	7.9-8.4	1-10	0	0	0
YmrA:							
Yomont-----	0-12	5.0-10	7.9-8.4	2-10	0	0.0-2.0	0
	12-24	5.0-10	7.9-8.4	2-10	0	0.0-2.0	0
	24-31	5.0-10	7.9-8.4	2-10	0	0.0-2.0	0
	31-39	5.0-10	7.9-8.4	2-10	0	0.0-2.0	0
	39-80	5.0-10	7.9-8.4	2-10	0	0.0-2.0	0
YmtA:							
Yomont-----	0-7	5.0-10	7.9-8.4	2-10	0	0.0-2.0	0
	7-16	5.0-10	7.9-8.4	2-10	0	0.0-2.0	0
	16-21	5.0-10	7.9-8.4	2-10	0	0.0-2.0	0
	21-60	5.0-10	7.9-8.4	2-10	0	0.0-2.0	0
	60-80	5.0-10	7.9-8.4	2-10	0	0.0-2.0	0

## Chemical Analyses of Selected Soils

The results of chemical analysis of several pedons are given in table 22, "Chemical Analyses of Selected Soils." The data are for soils sampled at carefully selected sites. The pedons are typical of the series in this survey. The Soil Survey Laboratory, Lincoln, Nebraska, analyzed the soil samples.

Most determinations were made on soil material smaller than 2 millimeters in diameter. Measurements reported as percent or quantity of unit weight were calculated on an oven-dry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods (USDA-NRCS, 1996).

*Organic carbon*—wet combustion. Walkley-Black modified acid-dichromate, ferric sulfate titration (6A1c).

*Extractable cations*—ammonium acetate pH 7.0, atomic absorption; calcium (6N2e), magnesium (6O2d), sodium (6P2b), potassium (6Q2b).

*Extractable acidity*—barium chloride-triethanolamine IV (6H5a).

*Cation-exchange capacity*—ammonium acetate, pH 7.0, steam distillation (5A8b).

*Cation-exchange capacity*—sum of cations (5A3a).

*Base saturation*—sum of cations, TEA, pH 8.2 (5C3).

*Base saturation*—ammonium acetate, pH 7.0 (5C1).

*Reaction (pH)*—calcium chloride (8C1f).

*Reaction (pH)*—1:1 water dilution (8C1f).

Table 22.--Chemical Analyses of Selected Soils  
 [Absence of an entry indicates that data were not estimated]

Soil name and sample number*	Hori- zon	Depth	Organic carbon	Extractable bases (Ammonium acetate)				Extract- able acidity	Cation-exchange capacity		Base saturation		pH	
				Ca	Mg	Na	K		Sum of cations	Ammonium acetate	Sum of cations	Ammonium acetate	CaCl <sub>2</sub> 1:2	H <sub>2</sub> O 1:1
		In		-----Milliequivalents per 100 grams of soil-----							Pct	Pct		
Abbie: S93OK-059-007	Ap1	0-6	0.96	14.4	2.2	TR	2.3	2.9	21.8	17.2	87	100	6.6	6.9
	Ap2	6-12	0.85	13.2	2.5	0.1	1.3	5.1	22.2	19.1	77	90	5.5	6.2
	Bt1	12-17	0.78	17.5	3.3	0.1	0.8	3.4	25.1	21.7	86	100	6.5	7.2
	Bt2	17-24	0.48	15.4	2.7	0.1	0.5	2.6	21.3	18.4	88	100	6.8	7.5
	Btk1	24-33	0.30	---	2.4	TR	0.5	---	---	14.6	100	100	7.6	8.2
	Btk2	33-44	0.22	---	3.2	TR	0.4	---	---	16.4	100	100	7.7	8.3
	Akb	44-49	0.69	---	3.9	0.1	0.4	---	---	15.2	100	100	7.6	8.1
	Btkb1	49-63	0.25	---	5.2	0.2	0.6	---	---	18.1	100	100	7.6	8.1
	Btkb2	63-72	0.17	---	7.0	0.7	0.8	---	---	16.0	100	100	7.6	8.1
Btkb3	72-80	0.09	---	6.4	0.8	0.7	---	---	9.5	100	100	7.7	8.3	
Btkb4	80-90	0.07	---	3.2	0.5	0.4	---	---	10.8	100	100	7.8	8.4	
Deepwood: S94OK-059-011	A1	0-4	1.16	14.5	2.2	TR	0.5	---	17.2	10.3	100	100	7.6	8.2
	A2	4-12	0.80	14.7	2.3	---	0.3	---	17.3	9.5	100	100	7.6	8.2
	Bk1	12-23	0.59	---	2.3	TR	0.3	---	---	9.1	100	100	7.7	8.3
	Bk2	23-28	0.37	---	2.7	TR	0.2	---	---	6.7	100	100	7.8	8.4
	Bk3	28-39	0.32	---	3.2	TR	0.2	---	---	7.1	100	100	7.8	8.5
	Bk4	39-56	0.16	---	3.9	TR	0.2	---	---	6.8	100	100	7.9	8.5
	Bk4	56-67	0.15	---	4.8	TR	0.2	---	---	7.0	100	100	7.9	8.6
	Bk4	67-79	0.10	---	5.9	TR	0.2	---	---	7.3	100	100	8.0	8.7
	Bck	79-92	0.11	---	6.6	0.1	0.2	---	---	6.8	100	100	8.1	8.7
Ck	92-99	0.07	---	6.4	0.1	0.2	---	---	6.0	100	100	8.2	8.8	
Devol: S94OK-059-010	A	0-6	0.50	3.6	0.8	0.1	0.3	0.5	5.3	4.1	91	100	6.0	6.8
	Btd	6-10	0.35	6.5	1.0	0.1	0.3	---	7.9	7.2	100	100	6.1	6.9
	Bt2	10-23	0.11	5.9	0.8	0.1	0.2	---	7.0	6.1	100	100	6.4	7.2
	Bw	23-38	0.08	5.9	0.5	0.1	0.2	---	6.7	5.9	100	100	6.6	7.4
	2Bk	38-49	0.07	10.1	0.4	0.1	0.2	---	10.8	5.4	100	100	7.7	8.3
	2Bw1	49-60	0.08	11.7	0.7	0.1	0.2	---	12.7	6.5	100	100	7.7	8.3
	2Bw2	60-69	0.08	---	0.9	0.1	0.2	---	---	6.4	100	100	7.7	8.3
	2Btk	69-76	0.10	14.0	1.0	0.1	0.2	---	15.3	7.3	100	100	7.7	8.3
	2C1	76-91	0.07	13.5	1.0	0.2	0.2	---	14.9	6.0	100	100	7.7	8.3
2C2	91-98	0.09	10.9	1.5	TR	0.3	---	12.7	7.4	100	100	7.7	8.4	

\* See footnote at end of table.

Table 22.--Chemical Analyses of Selected Soils--Continued

Soil name and sample number*	Hori- zon	Depth	Organic carbon	Extractable bases (Ammonium acetate)				Extract- able acidity	Cation-exchange capacity		Base saturation		pH	
				Ca	Mg	Na	K		Sum of cations	Ammonium acetate	Sum of cations	Ammonium acetate	CaCl <sub>2</sub> 1:2	H <sub>2</sub> O 1:1
		In		-----Milliequivalents per 100 grams of soil-----						Pct	Pct			
Eda: S94OK-059-014	A	0-4	0.93	4.2	0.9	0.1	0.4	---	5.6	5.3	100	100	6.3	6.9
	Bt1	4-10	0.34	4.5	1.1	0.1	0.3	---	6.0	5.7	100	100	6.2	7.0
	Bt2	10-18	0.18	4.8	1.2	0.1	0.2	---	6.3	6.2	100	100	6.1	7.0
	BC	18-28	0.09	4.6	1.1	0.1	0.2	0.1	6.1	5.7	98	100	6.2	7.1
	C	28-45	0.04	4.5	0.8	0.1	0.2	---	5.6	5.3	100	100	6.4	7.3
	2C1	45-52	0.04	4.1	0.6	TR	0.2	---	4.9	4.6	100	100	6.6	7.6
	2C2	52-59	0.03	4.5	0.6	0.1	0.2	---	5.4	4.7	100	100	6.7	7.6
	2C3	59-69	0.03	4.8	0.6	0.1	0.1	0.6	6.2	5.0	90	100	6.7	7.5
	2C4	69-85	0.03	5.6	0.5	0.1	0.1	0.1	6.4	5.6	98	100	7.1	7.8
	2C5	85-99	0.06	---	1.2	0.2	0.2	---	---	7.9	100	100	7.7	8.2
Jester: S93OK-059-001	A	0-5	0.53	3.7	0.7	0.1	0.2	0.7	5.4	3.7	87	100	6.5	7.0
	AC	5-17	0.20	6.0	0.5	TR	0.2	0.6	7.3	2.7	92	100	7.4	7.9
	C1	17-42	0.11	---	0.4	TR	0.1	---	---	1.6	100	100	7.8	8.4
	2C2	42-57	---	---	0.5	TR	TR	---	---	1.5	100	100	7.9	8.6
	2C3	57-79	---	---	0.4	0.1	0.2	---	---	1.4	100	100	7.9	8.6
Lincoln: S93OK-059-008	A	0-7	0.24	---	0.8	---	TR	---	---	3.4	100	100	7.7	8.3
	AC	7-19	0.08	---	0.7	---	0.1	---	---	2.2	100	100	7.9	8.6
	C1	19-30	0.06	---	0.5	---	TR	---	---	1.9	100	100	7.9	8.6
	C2	30-47	0.05	---	0.6	TR	TR	---	---	1.7	100	100	7.9	8.7
	C3	47-56	---	---	0.7	TR	TR	---	---	1.3	100	100	7.9	8.5
	C4	56-71	---	---	0.7	0.1	---	---	---	1.1	100	100	8.1	8.8
Lugert: S94OK-059-016	A1	0-4	1.62	---	4.6	0.2	1.4	---	---	15.1	100	100	7.5	7.8
	A2	4-11	1.10	---	3.5	0.1	1.0	---	---	14.5	100	100	7.6	8.3
	Bw	11-18	0.71	---	4.6	---	0.8	---	---	----	100	---	7.8	8.2
	Bk1	18-26	0.54	---	6.1	---	0.5	---	---	10.8	100	100	7.9	8.5
	Bk2	26-36	0.41	---	11.9	0.7	0.5	---	---	10.5	100	100	8.0	8.0
	Ckz	36-48	0.36	---	21.8	2.4	0.5	---	---	11.3	100	100	8.4	8.4
	Azb1	48-55	0.50	---	24.5	2.9	0.6	---	---	14.8	100	100	8.2	8.2
	Azb2	55-69	0.60	---	23.6	2.3	0.6	---	---	16.6	100	100	8.1	8.1
	Cz1	69-78	0.39	---	19.2	1.5	0.5	---	---	14.4	100	100	8.1	8.1
	Cz2	78-88	0.18	---	12.9	0.7	0.3	---	---	10.6	100	100	8.2	8.2
Quinlan: S94OK-059-012	A	0-6	1.51	---	1.5	---	0.4	---	---	8.5	100	100	7.5	8.1
	Bk1	6-9	0.86	---	1.4	0.1	0.2	---	---	7.1	100	100	7.7	8.3
	Bk2	9-16	0.38	---	1.7	0.1	0.2	---	---	6.4	100	100	7.7	8.4
	Cr1	16-22	0.16	---	2.3	0.1	0.1	---	---	5.1	100	100	7.8	8.5
	Cr2	22-33	0.09	---	3.1	0.2	0.2	---	---	5.2	100	100	7.9	8.6
	Cr3	33-43	0.07	---	5.4	0.1	0.1	---	---	4.3	100	100	8.0	8.6

\* See footnote at end of table.



Table 22.--Chemical Analyses of Selected Soils--Continued

Soil name and sample number*	Hori- zon	Depth	Organic carbon	Extractable bases (Ammonium acetate)				Extract- able acidity	Cation-exchange capacity		Base saturation		pH	
				Ca	Mg	Na	K		Sum of cations	Ammonium acetate	Sum of cations	Ammonium acetate	CaCl <sub>2</sub> 1:2	H <sub>2</sub> O 1:1
		In		-----Milliequivalents per 100 grams of soil-----						Pct	Pct			
St. Paul: S93OK-059-005	Ap	0-7	0.89	7.8	4.5	---	0.9	3.0	16.2	13.8	81	96	5.6	6.2
	A	7-13	0.97	13.0	6.2	---	0.6	3.5	23.3	19.1	85	100	6.5	7.0
	Bt	13-22	0.89	14.8	7.2	TR	0.6	1.9	24.5	21.1	92	100	7.0	7.8
	Btk1	22-36	0.50	---	11.3	0.1	0.5	---	---	22.0	100	100	7.7	8.3
	Btk2	36-52	0.23	---	11.3	0.2	0.3	---	---	15.2	100	100	7.8	8.5
	Btk3	52-65	0.12	---	11.8	0.4	0.2	---	---	11.4	100	100	7.9	8.3
	Abt	65-76	0.14	---	18.3	0.8	0.6	---	---	16.7	100	100	8.0	8.3
	Cb	76-86	0.11	---	18.9	0.9	0.6	---	---	16.9	100	100	8.0	8.3
Westola: S94OK-059-015	A1	0-5	2.58	---	3.7	0.1	1.3	---	---	13.7	100	100	7.4	7.9
	A2	5-10	0.72	---	2.3	0.2	0.9	---	---	8.2	100	100	7.6	8.2
	BC1	10-19	0.34	---	2.0	0.1	0.2	---	---	5.5	100	100	7.8	8.2
	BC2	19-25	0.26	---	2.1	0.1	0.2	---	---	5.1	100	100	7.9	8.3
	BCk	25-42	0.19	---	2.6	0.1	0.2	---	---	5.4	100	100	7.9	8.5
	C1	42-53	0.05	---	1.6	0.1	0.1	---	---	2.9	100	100	8.0	8.4
	C2	53-55	0.31	---	5.1	0.2	0.4	---	---	13.2	100	100	7.7	7.8
	C3	55-66	0.07	---	3.0	0.2	0.1	---	---	5.5	100	100	7.9	8.0
	C4	66-73	0.09	---	5.3	0.2	0.2	---	---	7.5	100	100	7.9	8.1
	C5	73-90	0.15	---	8.4	0.2	0.3	---	---	13.1	100	100	7.8	8.0
	C6	90-99	---	---	1.6	0.3	TR	---	---	1.2	100	100	8.0	8.2
Yomont: S93OK-059-002	A	0-7	2.17	---	3.9	TR	1.1	---	---	11.3	100	100	7.4	7.8
	AC	7-16	0.84	---	2.8	TR	4.7	---	---	11.4	100	100	7.6	8.1
	Ck1	16-29	0.58	---	3.8	0.1	0.4	---	---	11.4	100	100	7.6	8.3
	Ck2	29-48	0.58	---	5.0	0.1	0.5	---	---	13.2	100	100	7.6	8.2
	Ck3	48-60	0.26	---	4.3	0.1	0.2	---	---	7.7	100	100	7.7	8.2
	2C1	60-73	0.03	---	1.3	0.1	0.1	---	---	2.6	100	100	7.7	8.1
	2C2	73-80	0.02	---	0.7	0.1	0.1	---	---	0.8	100	100	7.8	8.5

\*Pedons are located as follows:

Abbie (S93OK-059-007), about 1,700 feet south and 1,800 feet west of the northeast corner of sec. 23, T. 28 N., R. 26 W. This pedon is the typical pedon for map unit AbbB in the survey area.

Deepwood (S94OK-059-011), about 650 feet south and 500 feet east of the northwest corner of sec. 33, T. 28 N., R. 23 W. This pedon is slightly more alkaline in the subsoil than is definitive for the series. This pedon provides supporting data for the series and map unit QWDE in the survey area.

Devol (S94OK-059-010), about 1,800 feet north and 500 feet east of the southwest corner of sec. 6, T. 27 N., R. 25 W. This pedon is the typical pedon for map unit DvlC in the survey area.

Eda (S94OK-059-014), about 4,200 feet south and 2,200 feet west of the northeast corner of sec. 26, T. 25 N., R. 22 W. This pedon is the typical pedon for map unit EdlE in the survey area.

Jester (S93OK-059-001), about 2,000 feet west and 1,900 feet north of the southeast corner of sec. 32, T. 25 N., R. 22 W. This pedon is the typical pedon for map unit JssF in the survey area.

Lincoln (S93OK-059-008), about 2,500 feet east and 2,600 feet north of the southwest corner sec. 31, T. 26 N., R. 24 W. This pedon is slightly more alkaline in the subsoil than is definitive for the series. This pedon provides supporting data for the series and map unit LsoA in the survey area.

Lugert (S94OK-059-016), about 200 feet west and 50 feet south of the northeast corner of sec. 21, T. 29 N., R. 23 W. This pedon is the typical pedon for map unit LgtA in the survey area.

Quinlan (S94OK-059-012), about 1,700 feet south and 1,700 feet east of the northwest corner of sec. 32, T. 26 N., R. 21 W. This pedon is slightly more alkaline in the subsoil than is definitive for the series. This pedon provides supporting data for the series and map unit QWDE in the survey area.

St. Paul (S93OK-059-005), about 900 feet west and 1,600 feet south of the northeast corner of sec. 32, T. 29 N., R. 22 W. This pedon is the typical pedon for map unit StpB in the survey area.

Westola (S94OK-059-015), about 2,600 feet north and 1,600 feet west of the southeast corner of sec. 17, T. 27 N., R. 21 W. This pedon is the typical pedon for map unit WstA in the survey area.

Yomont (S93OK-059-002), about 2,000 feet east and 1,600 feet south of the northwest corner of sec. 20, T. 26 N., R. 21 W. This pedon is the typical pedon for map unit YmtA in the survey area.

## Water Features

Table 23, "Water Features," gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

*Hydrologic soil groups* are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

*Water table* refers to a saturated zone in the soil. The table indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

*Ponding* is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

*Flooding* is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

*Duration and frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not

probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Table 23.--Water Features

[Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<i>Ft</i>	<i>Ft</i>	<i>Ft</i>				
AbbA: Abbie-----	B	Jan-Dec	---	---	---	---	None	---	None
AbbB: Abbie-----	B	Jan-Dec	---	---	---	---	None	---	None
AbbB2: Abbie-----	B	Jan-Dec	---	---	---	---	None	---	None
AbbC: Abbie-----	B	Jan-Dec	---	---	---	---	None	---	None
AbbC2: Abbie-----	B	Jan-Dec	---	---	---	---	None	---	None
AbsB: Abilene-----	C	Jan-Dec	---	---	---	---	None	---	None
AclA: Abbie-----	B	Jan-Dec	---	---	---	---	None	---	None
AflB: Abbie-----	B	Jan-Dec	---	---	---	---	None	---	None
AflC: Abbie-----	B	Jan-Dec	---	---	---	---	None	---	None
Berda-----	B	Jan-Dec	---	---	---	---	None	---	None
BdaC: Berda-----	B	Jan-Dec	---	---	---	---	None	---	None
BdaD: Berda-----	B	Jan-Dec	---	---	---	---	None	---	None
CRVE: Cottonwood---	C	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop-	D	Jan-Dec	---	---	---	---	None	---	None
Vinson-----	B	Jan-Dec	---	---	---	---	None	---	None
DAM: Dam-----	D	Jan-Dec	---	---	---	---	None	---	None
DevE: Devol-----	B	Jan-Dec	---	---	---	---	None	---	None
DpwB: Deepwood-----	B	Jan-Dec	---	---	---	---	None	---	None
DpwC: Deepwood-----	B	Jan-Dec	---	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<i>Ft</i>	<i>Ft</i>	<i>Ft</i>				
DpwD: Deepwood-----	B	Jan-Dec	---	---	---	---	None	---	None
DpwE: Deepwood-----	B	Jan-Dec	---	---	---	---	None	---	None
DvlB: Devol-----	B	Jan-Dec	---	---	---	---	None	---	None
DvlC: Devol-----	B	Jan-Dec	---	---	---	---	None	---	None
DvlD: Devol-----	B	Jan-Dec	---	---	---	---	None	---	None
EdlC: Eda-----	A	Jan-Dec	---	---	---	---	None	---	None
EdlE: Eda-----	A	Jan-Dec	---	---	---	---	None	---	None
FayB: Farry-----	B	Jan-Dec	---	---	---	---	None	---	None
FayC: Farry-----	B	Jan-Dec	---	---	---	---	None	---	None
FoFE: Fortyone-----	B	Jan-Dec	---	---	---	---	None	---	None
Farry-----	B	Jan-Dec	---	---	---	---	None	---	None
FrkA: Frankirk-----	C	Jan-Dec	---	---	---	---	None	---	None
FrkB: Frankirk-----	C	Jan-Dec	---	---	---	---	None	---	None
FtnB: Fortyone-----	B	Jan-Dec	---	---	---	---	None	---	None
FtnC: Fortyone-----	B	Jan-Dec	---	---	---	---	None	---	None
FtnD: Fortyone-----	B	Jan-Dec	---	---	---	---	None	---	None
GcsA: Gracemore----	C	January	0.5-2.1	>6.0	---	---	None	---	None
		February	0.5-2.1	>6.0	---	---	None	---	None
		March	0.5-2.1	>6.0	---	---	None	Very brief	Rare
		April	0.5-2.1	>6.0	---	---	None	Very brief	Rare
		May	0.5-2.1	>6.0	---	---	None	Very brief	Rare
		June	---	---	---	---	None	Very brief	Rare
		July	---	---	---	---	None	Very brief	Rare
		August	---	---	---	---	None	Very brief	Rare
		November	0.5-2.1	>6.0	---	---	None	---	None
		December	0.5-2.1	>6.0	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<i>Ft</i>	<i>Ft</i>	<i>Ft</i>				
GdfB: Grandfield---	B	Jan-Dec	---	---	---	---	None	---	None
GdfC: Grandfield---	B	Jan-Dec	---	---	---	---	None	---	None
GDGE: Grandfield---	B	Jan-Dec	---	---	---	---	None	---	None
Devol-----	B	Jan-Dec	---	---	---	---	None	---	None
Grandmore----	B	Jan-Dec	---	---	---	---	None	---	None
GdmB: Grandmore----	B	Jan-Dec	---	---	---	---	None	---	None
GfsA: Gracemore----	C	January	0.5-2.5	>6.0	---	---	None	---	None
		February	0.5-2.5	>6.0	---	---	None	---	None
		March	0.5-2.5	>6.0	---	---	None	Very brief	Occasional
		April	0.5-2.5	>6.0	---	---	None	Very brief	Occasional
		May	0.5-2.5	>6.0	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		November	0.5-2.5	>6.0	---	---	None	---	None
		December	0.5-2.5	>6.0	---	---	None	---	None
GmrA: Gracemont----		January	0.5-1.5	>6.0	---	---	None	---	None
		February	0.5-1.5	>6.0	---	---	None	---	None
		March	0.5-1.5	>6.0	---	---	None	Brief	Rare
	C	April	0.5-1.5	>6.0	---	---	None	Brief	Rare
		May	0.5-1.5	>6.0	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		November	0.5-1.5	>6.0	---	---	None	---	None
		December	0.5-1.5	>6.0	---	---	None	---	None
GmsA: Gracemont----		January	0.5-1.5	>6.0	---	---	None	---	None
		February	0.5-1.5	>6.0	---	---	None	---	None
		March	0.5-1.5	>6.0	---	---	None	Brief	Rare
		April	0.5-1.5	>6.0	---	---	None	Brief	Rare
		May	0.5-1.5	>6.0	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		November	0.5-1.5	>6.0	---	---	None	---	None
		December	0.5-1.5	>6.0	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<i>Ft</i>	<i>Ft</i>	<i>Ft</i>				
GrmA:									
Gracemore----	C	January	0.5-2.1	>6.0	---	---	None	---	None
		February	0.5-2.1	>6.0	---	---	None	---	None
		March	0.5-2.1	>6.0	---	---	None	Very brief	Rare
		April	0.5-2.1	>6.0	---	---	None	Very brief	Rare
		May	0.5-2.1	>6.0	---	---	None	Very brief	Rare
		June	---	---	---	---	None	Very brief	Rare
		July	---	---	---	---	None	Very brief	Rare
		August	---	---	---	---	None	Very brief	Rare
		November	0.5-2.1	>6.0	---	---	None	---	None
		December	0.5-2.1	>6.0	---	---	None	---	None
HdGB:									
Hardeman-----	B	Jan-Dec	---	---	---	---	None	---	None
Grandmore----	B	Jan-Dec	---	---	---	---	None	---	None
HdGC:									
Hardeman-----	B	Jan-Dec	---	---	---	---	None	---	None
Grandmore----	B	Jan-Dec	---	---	---	---	None	---	None
HdmB:									
Hardeman-----	B	Jan-Dec	---	---	---	---	None	---	None
HdmC:									
Hardeman-----	B	Jan-Dec	---	---	---	---	None	---	None
IreA:									
Irene-----	B	Jan-Dec	---	---	---	---	None	---	None
IreB:									
Irene-----	B	Jan-Dec	---	---	---	---	None	---	None
IreC:									
Irene-----	B	Jan-Dec	---	---	---	---	None	---	None
IreD:									
Irene-----	B	Jan-Dec	---	---	---	---	None	---	None
JssF:									
Jester-----	A	Jan-Dec	---	---	---	---	None	---	None
JstC:									
Jester-----	A	Jan-Dec	---	---	---	---	None	---	None
KidB:									
Kingsdown----	B	Jan-Dec	---	---	---	---	None	---	None
KiHE:									
Kingsdown----	B	Jan-Dec	---	---	---	---	None	---	None
Hardeman-----	B	Jan-Dec	---	---	---	---	None	---	None
LgtA:									
Lugert-----	B	March	---	---	---	---	None	Very brief	Occasional
		April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional



Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<i>Ft</i>	<i>Ft</i>	<i>Ft</i>				
LiJC: Lincoln-----	A	January	5.0-6.7	>6.0	---	---	None	---	None
		February	5.0-6.7	>6.0	---	---	None	---	None
		March	5.0-6.7	>6.0	---	---	None	---	None
		April	5.0-6.7	>6.0	---	---	None	Brief	Rare
		May	5.0-6.7	>6.0	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
		October	---	---	---	---	None	Brief	Rare
		November	5.0-6.7	>6.0	---	---	None	---	None
		December	5.0-6.7	>6.0	---	---	None	---	None
Jester-----	A	April	---	---	---	---	None	Very brief	Rare
		May	---	---	---	---	None	Very brief	Rare
		June	---	---	---	---	None	Very brief	Rare
		July	---	---	---	---	None	Very brief	Rare
		August	---	---	---	---	None	Very brief	Rare
		September	---	---	---	---	None	Very brief	Rare
		October	---	---	---	---	None	Very brief	Rare
LikB: Likes-----	A	Jan-Dec	---	---	---	---	None	---	None
LisA: Lincoln-----	A	January	5.0-6.7	>6.0	---	---	None	---	None
		February	5.0-6.7	>6.0	---	---	None	---	None
		March	5.0-6.7	>6.0	---	---	None	---	None
		April	5.0-6.7	>6.0	---	---	None	Brief	Frequent
		May	5.0-6.7	>6.0	---	---	None	Brief	Frequent
		June	---	---	---	---	None	Brief	Frequent
		July	---	---	---	---	None	Brief	Frequent
		August	---	---	---	---	None	Brief	Frequent
		September	---	---	---	---	None	Brief	Frequent
		October	---	---	---	---	None	Brief	Frequent
		November	5.0-6.7	>6.0	---	---	None	---	None
		December	5.0-6.7	>6.0	---	---	None	---	None
LncA: Lincoln-----	A	January	5.0-6.7	>6.0	---	---	None	---	None
		February	5.0-6.7	>6.0	---	---	None	---	None
		March	5.0-6.7	>6.0	---	---	None	---	None
		April	5.0-6.7	>6.0	---	---	None	Brief	Rare
		May	5.0-6.7	>6.0	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
		October	---	---	---	---	None	Brief	Rare
		November	5.0-6.7	>6.0	---	---	None	---	None
		December	5.0-6.7	>6.0	---	---	None	---	None
LrOE: Laverne-----	D	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop-	D	Jan-Dec	---	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<i>Ft</i>	<i>Ft</i>	<i>Ft</i>				
LshA: Lesho-----	C	March	2.0-4.0	>6.0	---	---	None	Very brief	Rare
		April	2.0-4.0	>6.0	---	---	None	Very brief	Rare
		May	2.0-4.0	>6.0	---	---	None	Very brief	Rare
		June	2.0-4.0	>6.0	---	---	None	Very brief	Rare
		July	---	---	---	---	None	Very brief	Rare
LsoA: Lincoln-----	A	January	5.0-6.7	>6.0	---	---	None	---	None
		February	5.0-6.7	>6.0	---	---	None	---	None
		March	5.0-6.7	>6.0	---	---	None	---	None
		April	5.0-6.7	>6.0	---	---	None	Brief	Occasional
		May	5.0-6.7	>6.0	---	---	None	Brief	Occasional
		June	---	---	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
		October	---	---	---	---	None	Brief	Occasional
		November	5.0-6.7	>6.0	---	---	None	---	None
		December	5.0-6.7	>6.0	---	---	None	---	None
M-W: Water.									
MLBB: Mobeetie-----	B	Jan-Dec	---	---	---	---	None	---	None
Likes-----	A	Jan-Dec	---	---	---	---	None	---	None
Berda-----	B	Jan-Dec	---	---	---	---	None	---	None
MLBC: Mobeetie-----	B	Jan-Dec	---	---	---	---	None	---	None
Likes-----	A	Jan-Dec	---	---	---	---	None	---	None
Berda-----	B	Jan-Dec	---	---	---	---	None	---	None
MLBE: Mobeetie-----	B	Jan-Dec	---	---	---	---	None	---	None
Likes-----	A	Jan-Dec	---	---	---	---	None	---	None
Berda-----	B	Jan-Dec	---	---	---	---	None	---	None
MnsB: Mansic-----	B	Jan-Dec	---	---	---	---	None	---	None
MnsC: Mansic-----	B	Jan-Dec	---	---	---	---	None	---	None
MsnB: Manson-----	B	Jan-Dec	---	---	---	---	None	---	None
MsnC: Manson-----	B	Jan-Dec	---	---	---	---	None	---	None
MsnC2: Manson-----	B	Jan-Dec	---	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<i>Ft</i>	<i>Ft</i>	<i>Ft</i>				
OMBE:									
Oklark-----	B	Jan-Dec	---	---	---	---	None	---	None
Mansic-----	B	Jan-Dec	---	---	---	---	None	---	None
Berda-----	B	Jan-Dec	---	---	---	---	None	---	None
OMBG:									
Oklark-----	B	Jan-Dec	---	---	---	---	None	---	None
Mansic-----	B	Jan-Dec	---	---	---	---	None	---	None
Berda-----	B	Jan-Dec	---	---	---	---	None	---	None
PdoA:									
Paloduro-----	B	Jan-Dec	---	---	---	---	None	---	None
PdoB:									
Paloduro-----	B	Jan-Dec	---	---	---	---	None	---	None
PdoC2:									
Paloduro-----	B	Jan-Dec	---	---	---	---	None	---	None
PIT:									
Pits-----	---	Jan-Dec	---	---	---	---	None	---	None
PlmB:									
Plemons-----	B	Jan-Dec	---	---	---	---	None	---	None
PlmC:									
Plemons-----	B	Jan-Dec	---	---	---	---	None	---	None
PlmD:									
Plemons-----	B	Jan-Dec	---	---	---	---	None	---	None
QnWC3:									
Quinlan-----	C	Jan-Dec	---	---	---	---	None	---	None
Woodward-----	B	Jan-Dec	---	---	---	---	None	---	None
QnWD:									
Quinlan-----	C	Jan-Dec	---	---	---	---	None	---	None
Woodward-----	B	Jan-Dec	---	---	---	---	None	---	None
QnWE:									
Quinlan-----	C	Jan-Dec	---	---	---	---	None	---	None
Woodward-----	B	Jan-Dec	---	---	---	---	None	---	None
QRWG:									
Quinlan-----	C	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop-	D	Jan-Dec	---	---	---	---	None	---	None
Woodward-----	B	Jan-Dec	---	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<i>Ft</i>	<i>Ft</i>	<i>Ft</i>				
QRYG:									
Quinlan-----	C	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop-	D	Jan-Dec	---	---	---	---	None	---	None
Yomont-----	B	April	---	---	---	---	None	Very brief	Frequent
		May	---	---	---	---	None	Very brief	Frequent
		June	---	---	---	---	None	Very brief	Frequent
		July	---	---	---	---	None	Very brief	Frequent
		August	---	---	---	---	None	Very brief	Frequent
		September	---	---	---	---	None	Very brief	Frequent
		October	---	---	---	---	None	Very brief	Frequent
		November	---	---	---	---	None	Very brief	Frequent
QWDE:									
Quinlan-----	C	Jan-Dec	---	---	---	---	None	---	None
Woodward-----	B	Jan-Dec	---	---	---	---	None	---	None
Deepwood-----	B	Jan-Dec	---	---	---	---	None	---	None
QWRC:									
Quinlan-----	C	Jan-Dec	---	---	---	---	None	---	None
Woodward-----	B	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop-	D	Jan-Dec	---	---	---	---	None	---	None
RoCH:									
Rock outcrop-	D	Jan-Dec	---	---	---	---	None	---	None
Cottonwood---	C	Jan-Dec	---	---	---	---	None	---	None
RssA:									
Rosston-----	D	May	0.0	>6.0	0.0-3.0	Long	Frequent	---	None
		June	0.0	>6.0	0.0-3.0	Long	Frequent	---	None
		July	0.0	>6.0	0.0-3.0	Long	Frequent	---	None
		August	0.0	>6.0	0.0-3.0	Long	Frequent	---	None
		September	0.0	>6.0	0.0-3.0	Long	Frequent	---	None
		October	0.0	>6.0	0.0-3.0	Long	Frequent	---	None
		November	0.0	>6.0	0.0-3.0	Long	Frequent	---	None
SAL:									
Salt flats---	D	January	0.0	>6.0	0.0-1.0	Brief	Occasional	---	None
		February	0.0	>6.0	0.0-1.0	Brief	Occasional	---	None
		March	0.0	>6.0	0.0-1.0	Brief	Occasional	---	None
		April	0.0	>6.0	0.0-1.0	Brief	Occasional	Very long	Frequent
		May	---	---	---	---	None	Very long	Frequent
		June	---	---	---	---	None	Very long	Frequent
		July	---	---	---	---	None	Very long	Frequent
		August	---	---	---	---	None	Very long	Frequent
		September	---	---	---	---	None	Very long	Frequent
		October	---	---	---	---	None	Very long	Frequent
		November	0.0	>6.0	0.0-1.0	Brief	Occasional	---	None
		December	0.0	>6.0	0.0-1.0	Brief	Occasional	---	None
Sela:									
Selman-----	B	Jan-Dec	---	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<i>Ft</i>	<i>Ft</i>	<i>Ft</i>				
SelB: Selman-----	B	Jan-Dec	---	---	---	---	None	---	None
SelC: Selman-----	B	Jan-Dec	---	---	---	---	None	---	None
SelC2: Selman-----	B	Jan-Dec	---	---	---	---	None	---	None
SelD: Selman-----	B	Jan-Dec	---	---	---	---	None	---	None
SelD2: Selman-----	B	Jan-Dec	---	---	---	---	None	---	None
SprA: Spur-----	B	April	---	---	---	---	None	Very brief	Rare
		May	---	---	---	---	None	Very brief	Rare
		June	---	---	---	---	None	Very brief	Rare
		July	---	---	---	---	None	Very brief	Rare
		August	---	---	---	---	None	Very brief	Rare
		September	---	---	---	---	None	Very brief	Rare
		October	---	---	---	---	None	Very brief	Rare
SpsA: Spur-----	B	March	---	---	---	---	None	Very brief	Rare
		April	---	---	---	---	None	Very brief	Rare
		May	---	---	---	---	None	Very brief	Rare
		June	---	---	---	---	None	Very brief	Rare
		July	---	---	---	---	None	Very brief	Rare
		August	---	---	---	---	None	Very brief	Rare
		September	---	---	---	---	None	Very brief	Rare
		October	---	---	---	---	None	Very brief	Rare
StpA: St. Paul-----	B	Jan-Dec	---	---	---	---	None	---	None
StpB: St. Paul-----	B	Jan-Dec	---	---	---	---	None	---	None
StpC: St. Paul-----	B	Jan-Dec	---	---	---	---	None	---	None
StpD: St. Paul-----	B	Jan-Dec	---	---	---	---	None	---	None
TeWE: Teagard-----	D	Jan-Dec	---	---	---	---	None	---	None
Wellsford----	D	Jan-Dec	---	---	---	---	None	---	None
TexA: Texroy-----	B	Jan-Dec	---	---	---	---	None	---	None
TexB: Texroy-----	B	Jan-Dec	---	---	---	---	None	---	None
TexC: Texroy-----	B	Jan-Dec	---	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<i>Ft</i>	<i>Ft</i>	<i>Ft</i>				
TipA: Tipton-----	B	Jan-Dec	---	---	---	---	None	---	None
TipB: Tipton-----	B	Jan-Dec	---	---	---	---	None	---	None
TipC: Tipton-----	B	Jan-Dec	---	---	---	---	None	---	None
TipD: Tipton-----	B	Jan-Dec	---	---	---	---	None	---	None
TRQC: Talpa-----	D	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop-	D	Jan-Dec	---	---	---	---	None	---	None
Quinlan-----	C	Jan-Dec	---	---	---	---	None	---	None
TvlC: Tivoli-----	A	Jan-Dec	---	---	---	---	None	---	None
TvlE: Tivoli-----	A	Jan-Dec	---	---	---	---	None	---	None
TvlG: Tivoli-----	A	Jan-Dec	---	---	---	---	None	---	None
VerB: Vernon-----	D	Jan-Dec	---	---	---	---	None	---	None
VerC: Vernon-----	D	Jan-Dec	---	---	---	---	None	---	None
VerD: Vernon-----	D	Jan-Dec	---	---	---	---	None	---	None
VrrB: Vernon-----	D	Jan-Dec	---	---	---	---	None	---	None
VrrC: Vernon-----	D	Jan-Dec	---	---	---	---	None	---	None
W: Water.									
WodA: Woods-----	D	Jan-Dec	---	---	---	---	None	---	None
WodB: Woods-----	D	Jan-Dec	---	---	---	---	None	---	None
WodC: Woods-----	D	Jan-Dec	---	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<i>Ft</i>	<i>Ft</i>	<i>Ft</i>				
WQHE:									
Westola-----	B	April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		October	---	---	---	---	None	Very brief	Occasional
Quinlan-----	C	Jan-Dec	---	---	---	---	None	---	None
Hardeman-----	B	Jan-Dec	---	---	---	---	None	---	None
WQnB:									
Woodward-----	B	Jan-Dec	---	---	---	---	None	---	None
Quinlan-----	C	Jan-Dec	---	---	---	---	None	---	None
WQnC:									
Woodward-----	B	Jan-Dec	---	---	---	---	None	---	None
Quinlan-----	C	Jan-Dec	---	---	---	---	None	---	None
WslA:									
Westola-----	B	April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		October	---	---	---	---	None	Very brief	Occasional
WstA:									
Westola-----	B	April	---	---	---	---	None	Very brief	Rare
		May	---	---	---	---	None	Very brief	Rare
		June	---	---	---	---	None	Very brief	Rare
		July	---	---	---	---	None	Very brief	Rare
		August	---	---	---	---	None	Very brief	Rare
		September	---	---	---	---	None	Very brief	Rare
		October	---	---	---	---	None	Very brief	Rare
YmrA:									
Yomont-----	B	April	---	---	---	---	None	Very brief	Rare
		May	---	---	---	---	None	Very brief	Rare
		June	---	---	---	---	None	Very brief	Rare
		July	---	---	---	---	None	Very brief	Rare
		August	---	---	---	---	None	Very brief	Rare
		September	---	---	---	---	None	Very brief	Rare
		October	---	---	---	---	None	Very brief	Rare
		November	---	---	---	---	None	Very brief	Rare
YmtA:									
Yomont-----	B	April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		October	---	---	---	---	None	Very brief	Occasional
		November	---	---	---	---	None	Very brief	Occasional

## Soil Features

Table 24, "Soil Features," gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

*Subsidence* is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

*Potential for frost action* is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

*Risk of corrosion* pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.



Table 24.--Soil Features

[See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
AbbA: Abbie-----	---	---	---	---	0	---	None	Moderate	Low
AbbB: Abbie-----	---	---	---	---	0	---	None	Moderate	Low
AbbB2: Abbie-----	---	---	---	---	0	---	None	Moderate	Low
AbbC: Abbie-----	---	---	---	---	0	---	None	Moderate	Low
AbbC2: Abbie-----	---	---	---	---	0	---	None	Moderate	Low
AbsB: Abilene-----	---	---	---	---	0	---	None	High	Low
AclA: Abbie-----	---	---	---	---	0	---	None	Moderate	Low
AflB: Abbie-----	---	---	---	---	0	---	None	Moderate	Low
AflC: Abbie-----	---	---	---	---	0	---	None	Moderate	Low
BdaB: Berda-----	---	---	---	---	0	---	None	Moderate	Low
BdaC: Berda-----	---	---	---	---	0	---	None	Moderate	Low
BdaD: Berda-----	---	---	---	---	0	---	None	Moderate	Low

Table 24.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
CRVE: Cottonwood-----	Bedrock (paralithic)	3-12	---	Very strongly cemented	0	---	None	High	High
Rock outcrop-----	Bedrock (lithic)	0-3	---	Indurated	0	---	None	High	High
Vinson-----	Bedrock (paralithic)	20-40	---	Very strongly cemented	0	---	None	Moderate	Low
DAM: Dam-----	---	---	---	---	0	---	None	---	---
DevE: Devol-----	---	---	---	---	0	---	None	Low	Low
DpwB: Deepwood-----	---	---	---	---	0	---	None	Low	Low
DpwC: Deepwood-----	---	---	---	---	0	---	None	Low	Low
DpwD: Deepwood-----	---	---	---	---	0	---	None	Low	Low
DpwE: Deepwood-----	---	---	---	---	0	---	None	Low	Low
DvlB: Devol-----	---	---	---	---	0	---	None	Low	Low
DvlC: Devol-----	---	---	---	---	0	---	None	Low	Low
DvlD: Devol-----	---	---	---	---	0	---	None	Low	Low
EdlC: Eda-----	---	---	---	---	0	---	None	Low	Moderate
EdlE: Eda-----	---	---	---	---	0	---	None	Low	Moderate
FayB: Farry-----	---	---	---	---	0	---	None	Low	Low

Table 24.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
FayC: Farry-----	---	---	---	---	0	---	None	Low	Low
FOFE: Fortyone-----	---	---	---	---	0	---	None	Low	Low
Farry-----	---	---	---	---	0	---	None	Low	Low
FrkA: Frankirk-----	---	---	---	---	0	---	None	High	Low
FrkB: Frankirk-----	---	---	---	---	0	---	None	High	Low
FtnB: Fortyone-----	---	---	---	---	0	---	None	Low	Low
FtnC: Fortyone-----	---	---	---	---	0	---	None	Low	Low
FtnD: Fortyone-----	---	---	---	---	0	---	None	Low	Low
GcsA: Gracemore-----	---	---	---	---	0	---	None	Moderate	Low
GdfB: Grandfield-----	---	---	---	---	0	---	None	Low	Low
GdfC: Grandfield-----	---	---	---	---	0	---	None	Low	Low
GDGE: Grandfield-----	---	---	---	---	0	---	None	Low	Low
Devol-----	---	---	---	---	0	---	None	Low	Low
Grandmore-----	---	---	---	---	0	---	None	High	Low
GdmB: Grandmore-----	---	---	---	---	0	---	None	High	Low
GfsA: Gracemore-----	---	---	---	---	0	---	None	High	High



Table 24.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
KiHE: Kingsdown-----	---	---	---	---	---	---	---	Low	Low
Hardeman-----	---	---	---	---	0	---	None	Low	Low
LgtA: Lugert-----	---	---	---	---	0	---	None	Low	Low
LiJC: Lincoln-----	---	---	---	---	0	---	None	Low	Low
Jester-----	---	---	---	---	0	---	None	Low	Low
LikB: Likes-----	---	---	---	---	0	---	None	Low	Low
LisA: Lincoln-----	---	---	---	---	0	---	None	Low	Low
LncA: Lincoln-----	---	---	---	---	0	---	None	Low	Low
LROE: Laverne-----	Petrocalcic	4-20	0-3	Indurated	0	---	None	Moderate	Low
Rock outcrop-----	Bedrock (lithic)	0-3	---	Indurated	0	---	None	---	---
LshA: Lesho-----	---	---	---	---	0	---	Low	High	Low
LsoA: Lincoln-----	---	---	---	---	0	---	None	Low	Low
M-W: Water.									
MLBB: Mobeetie-----	---	---	---	---	0	---	None	Low	Low
Likes-----	---	---	---	---	0	---	None	Low	Low
Berda-----	---	---	---	---	0	---	None	Moderate	Low

Table 24.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
MLBC:									
Mobeetie-----	---	---	---	---	0	---	None	Low	Low
Likes-----	---	---	---	---	0	---	None	Low	Low
Berda-----	---	---	---	---	0	---	None	Moderate	Low
MLBE:									
Mobeetie-----	---	---	---	---	0	---	None	Low	Low
Likes-----	---	---	---	---	0	---	None	Low	Low
Berda-----	---	---	---	---	0	---	None	Moderate	Low
MnsB:									
Mansic-----	---	---	---	---	0	---	None	Moderate	Low
MnsC:									
Mansic-----	---	---	---	---	0	---	None	Moderate	Low
MsnB:									
Manson-----	---	---	---	---	0	---	None	Moderate	Low
MsnC:									
Manson-----	---	---	---	---	0	---	None	Moderate	Low
MsnC2:									
Manson-----	---	---	---	---	0	---	None	Moderate	Low
OMBE:									
Oklark-----	---	---	---	---	0	---	None	Low	Low
Mansic-----	---	---	---	---	0	---	None	Moderate	Low
Berda-----	---	---	---	---	0	---	Low	Moderate	Low
OMBG:									
Oklark-----	---	---	---	---	0	---	None	Low	Low
Mansic-----	---	---	---	---	0	---	None	Moderate	Low
Berda-----	---	---	---	---	0	---	None	Moderate	Low
PdoA:									
Paloduro-----	---	---	---	---	0	---	None	Moderate	Low

Table 24.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
PdoB: Paloduro-----	---	---	---	---	0	---	None	Moderate	Low
PdoC2: Paloduro-----	---	---	---	---	0	---	None	Moderate	Low
PIT: Pits-----	---	---	---	---	0	---	None	---	---
PlmB: Plemons-----	---	---	---	---	0	---	None	Moderate	Low
PlmC: Plemons-----	---	---	---	---	0	---	None	Moderate	Low
PlmD: Plemons-----	---	---	---	---	0	---	None	Moderate	Low
QnWC3: Quinlan-----	Bedrock (paralithic)	10-20	---	Weakly cemented	0	---	None	Moderate	Low
Woodward-----	Bedrock (paralithic)	20-40	---	Weakly cemented	0	---	None	Low	Low
QnWD: Quinlan-----	Bedrock (paralithic)	10-20	---	Weakly cemented	0	---	None	Moderate	Low
Woodward-----	Bedrock (paralithic)	20-40	---	Weakly cemented	0	---	None	Low	Low
QnWE: Quinlan-----	Bedrock (paralithic)	10-20	---	Weakly cemented	0	---	None	Moderate	Low
Woodward-----	Bedrock (paralithic)	20-40	---	Weakly cemented	0	---	None	Low	Low

Table 24.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
QRWG: Quinlan-----	Bedrock (paralithic)	10-20	---	Weakly cemented	0	---	None	Moderate	Low
Rock outcrop-----	Bedrock (lithic)	0-3	---	Indurated	0	---	None	---	---
Woodward-----	Bedrock (paralithic)	20-40	---	Weakly cemented	0	---	None	Low	Low
QRYG: Quinlan-----	Bedrock (paralithic)	10-20	---	Weakly cemented	0	---	None	Moderate	Low
Rock outcrop-----	Bedrock (lithic)	0-3	---	Indurated	0	---	None	---	---
Yomont-----	---	---	---	---	0	---	None	Low	Low
QWDE: Quinlan-----	Bedrock (paralithic)	10-20	---	Weakly cemented	0	---	None	Moderate	Low
Woodward-----	Bedrock (paralithic)	20-40	---	Weakly cemented	0	---	None	Low	Low
Deepwood-----	---	---	---	---	0	---	None	Low	Low
QWRC: Quinlan-----	Bedrock (paralithic)	10-20	---	Weakly cemented	0	---	None	Moderate	Low
Woodward-----	Bedrock (paralithic)	20-40	---	Weakly cemented	0	---	None	Low	Low
Rock outcrop-----	Bedrock (lithic)	0-3	---	Indurated	0	---	None	---	---
RoCH: Rock outcrop-----	Bedrock (lithic)	0-3	---	Indurated	0	---	None	High	High
Cottonwood-----	Bedrock (paralithic)	3-12	---	Very strongly cemented	0	---	None	High	High
RssA: Rosston-----	---	---	---	---	0	---	None	High	Low



Table 24.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
SAL: Salt flats-----	---	---	---	---	0	---	None	High	High
SelA: Selman-----	---	---	---	---	0	---	None	Moderate	Low
SelB: Selman-----	---	---	---	---	0	---	None	Moderate	Low
SelC: Selman-----	---	---	---	---	0	---	None	Moderate	Low
SelC2: Selman-----	---	---	---	---	0	---	None	Moderate	Low
SelD: Selman-----	---	---	---	---	0	---	None	Moderate	Low
SelD2: Selman-----	---	---	---	---	0	---	None	Moderate	Low
SprA: Spur-----	---	---	---	---	0	---	None	Moderate	Low
SpsA: Spur-----	---	---	---	---	0	---	None	Moderate	Low
StpA: St. Paul-----	---	---	---	---	0	---	None	Moderate	Low
StpB: St. Paul-----	---	---	---	---	0	---	None	Moderate	Low
StpC: St. Paul-----	---	---	---	---	0	---	None	Moderate	Low
StpD: St. Paul-----	---	---	---	---	0	---	None	Moderate	Low
TeWE: Teagard-----	Bedrock (paralithic)	20-40	---	Very weakly cemented	0	---	None	High	Low
Wellsford-----	Bedrock (paralithic)	10-20	---	Very weakly cemented	0	---	None	High	Low

Table 24.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
TexA: Texroy-----	---	---	---	---	0	---	None	Moderate	Low
TexB: Texroy-----	---	---	---	---	0	---	None	Moderate	Low
TexC: Texroy-----	---	---	---	---	0	---	None	Moderate	Low
TipA: Tipton-----	---	---	---	---	0	---	None	Moderate	Low
TipB: Tipton-----	---	---	---	---	0	---	None	Moderate	Low
TipC: Tipton-----	---	---	---	---	0	---	None	Moderate	Low
TipD: Tipton-----	---	---	---	---	0	---	None	Moderate	Low
TRQC: Talpa-----	Bedrock (lithic)	5-14	---	Indurated	0	---	None	High	Low
Rock outcrop-----	Bedrock (lithic)	0-3	---	Indurated	0	---	None	---	---
Quinlan-----	Bedrock (paralithic)	10-20	---	Weakly cemented	0	---	None	Moderate	Low
TvlC: Tivoli-----	---	---	---	---	0	---	None	Low	Low
TvlE: Tivoli-----	---	---	---	---	0	---	None	Low	Low
TvlG: Tivoli-----	---	---	---	---	0	---	None	Low	Low
VerB: Vernon-----	Bedrock (paralithic)	20-40	---	Very weakly cemented	0	---	None	High	Low
VerC: Vernon-----	Bedrock (paralithic)	20-40	---	Very weakly cemented	0	---	None	High	Low

Table 24.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
VerD: Vernon-----	Bedrock (paralithic)	20-40	---	Very weakly cemented	0	---	None	High	Low
VrrB: Vernon-----	Bedrock (paralithic)	20-40	---	Very weakly cemented	0	---	None	High	Low
VrrC: Vernon-----	Bedrock (paralithic)	20-40	---	Very weakly cemented	0	---	None	High	Low
W: Water.									
WodA: Woods-----	---	---	---	---	0	---	None	High	Low
WodB: Woods-----	---	---	---	---	0	---	None	High	Low
WodC: Woods-----	---	---	---	---	0	---	None	High	Low
WQHE: Westola-----	---	---	---	---	0	---	None	Low	Low
Quinlan-----	Bedrock (paralithic)	10-20	---	Weakly cemented	0	---	None	Moderate	Low
Hardeman-----	---	---	---	---	0	---	None	Low	Low
WQnB: Woodward-----	Bedrock (paralithic)	20-40	---	Weakly cemented	0	---	None	Low	Low
Quinlan-----	Bedrock (paralithic)	10-20	---	Weakly cemented	0	---	None	Moderate	Low
WQnC: Woodward-----	Bedrock (paralithic)	20-40	---	Weakly cemented	0	---	None	Low	Low
Quinlan-----	Bedrock (paralithic)	10-20	---	Weakly cemented	0	---	None	Moderate	Low

Table 24.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
WslA: Westola-----	---	---	---	---	0	---	None	Low	Low
WstA: Westola-----	---	---	---	---	0	---	None	Low	Low
YmrA: Yomont-----	---	---	---	---	0	---	None	Low	Low
YmtA: Yomont-----	---	---	---	---	0	---	None	Low	Low

## Classification of the Soils

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The system of soil classification used by the National Cooperative Soil Survey has six categories. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 25, "Classification of the Soils," shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

**ORDER.** Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

**SUBORDER.** Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Fluvent (*Fluv*, meaning flood plain, plus *ent*, from Entisol).

**GREAT GROUP.** Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Ustifluvents (*Usti*, meaning dryness, plus *fluvent*, the suborder of Entisols that occurs on flood plains).

**SUBGROUP.** Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group, but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Ustifluvents.

**FAMILY.** Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are: particle-size class, mineral content, temperature regime, thickness of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is sandy, mixed, thermic Typic Ustifluvents.

**SERIES.** The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

## **Soil Series and Their Morphology**

Each soil series recognized in the survey area is described in an “Official Soil Series Description.” These descriptions are available at the local office of the Natural Resources Conservation Service or online at <http://soils.usda.gov>.

Characteristics of the soil and the material in which it formed are identified for each soil series. A pedon, a small three-dimensional area of soil that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the “Soil Survey Manual” (Soil Survey Division Staff, 1993). Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” (Soil Survey Staff, 1999) and “Keys to Soil Taxonomy” (Soil Survey Staff, 1998). Following the pedon description is the range of important characteristics of the soils in the series.

Table 25.--Classification of the Soils

Soil name	Family or higher taxonomic class
Abbie-----	Fine-loamy, mixed, superactive, thermic Aridic Argiustolls
Ahilene-----	Fine, mixed, superactive, thermic Pachic Argiustolls
Berda-----	Fine-loamy, mixed, superactive, thermic Aridic Haplustepts
Burford-----	Fine-silty, mixed, superactive, thermic Typic Haplustepts
Carey-----	Fine-silty, mixed, superactive, thermic Typic Argiustolls
Colorado-----	Fine-loamy, mixed, superactive, calcareous, thermic Typic Ustifluvents
Cornick-----	Loamy, mixed, superactive, thermic Lithic Haplustolls
Cottonwood-----	Loamy, mixed, superactive, calcareous, thermic Lithic Ustorthents
Deepwood-----	Coarse-silty, mixed, superactive, thermic Typic Haplustepts
Devol-----	Coarse-loamy, mixed, superactive, thermic Typic Haplustalfs
Eda-----	Mixed, thermic Lamellic Ustipsamments
Farry-----	Fine-loamy, mixed, superactive, thermic Typic Argiustolls
Fortyone-----	Coarse-loamy, mixed, superactive, thermic Typic Haplustalfs
Frankirk-----	Fine, mixed, superactive, thermic Typic Argiustolls
Gracemont-----	Coarse-loamy, mixed, superactive, calcareous, thermic Oxyaquic Udifluvents
Gracemore-----	Sandy, mixed, thermic Oxyaquic Udifluvents
Grandfield-----	Fine-loamy, mixed, superactive, thermic Typic Haplustalfs
Grandmore-----	Fine-loamy, mixed, active, thermic Typic Haplustalfs
Guadalupe-----	Coarse-loamy, mixed, active, thermic Fluventic Haplustepts
Hardeman-----	Coarse-loamy, mixed, superactive, thermic Typic Haplustepts
Hollister-----	Fine, smectitic, thermic Typic Haplusterts
Irene-----	Fine-silty, mixed, superactive, thermic Pachic Argiustolls
Jester-----	Mixed, thermic Typic Ustipsamments
Kingsdown-----	Coarse-loamy, mixed, superactive, thermic Entic Haplustolls
Knoco-----	Clayey, mixed, active, calcareous, thermic, shallow Aridic Ustorthents
Laverne-----	Loamy-skeletal, mixed, superactive, thermic, shallow Petrocalcic Calciustolls
Lesho-----	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, thermic Fluvaquentic Haplustolls
Likes-----	Mixed, thermic Aridic Ustipsamments
Lincoln-----	Sandy, mixed, thermic Typic Ustifluvents
Lugert-----	Coarse-silty, mixed, superactive, thermic Fluventic Haplustolls
Mansic-----	Fine-loamy, mixed, superactive, thermic Aridic Calciustolls
Manson-----	Fine-loamy, mixed, superactive, thermic Calcidic Paleustolls
Mcknight-----	Fine-loamy, mixed, active, thermic Typic Haplustalfs
Mobeetie-----	Coarse-loamy, mixed, superactive, thermic Aridic Haplustepts
Obaro-----	Fine-silty, mixed, superactive, thermic Typic Haplustepts
Okark-----	Coarse-loamy, mixed, superactive, thermic Aridic Calciustolls
Paloduro-----	Fine-loamy, mixed, superactive, thermic Aridic Haplustolls
Plemons-----	Fine-loamy, mixed, superactive, thermic Calcidic Paleustalfs
Quinlan-----	Loamy, mixed, superactive, thermic, shallow Typic Haplustepts
Rosston-----	Fine, smectitic, thermic Ustic Epiaquerts
Ruella-----	Fine-loamy, mixed, superactive, thermic Udic Haplustepts
Selman-----	Fine-silty, mixed, superactive, thermic Typic Argiustolls
Spur-----	Fine-loamy, mixed, superactive, thermic Fluventic Haplustolls
St. Paul-----	Fine-silty, mixed, superactive, thermic Pachic Argiustolls
Talpa-----	Loamy, mixed, superactive, thermic Lithic Calciustolls
Teagard-----	Fine, smectitic, thermic Typic Haplusterts
Texroy-----	Fine-loamy, mixed, superactive, thermic Pachic Argiustolls
Tillman-----	Fine, mixed, superactive, thermic Vertic Paleustolls
Tipton-----	Fine-loamy, mixed, superactive, thermic Pachic Argiustolls
Tivoli-----	Mixed, thermic Typic Ustipsamments
Vernon-----	Fine, mixed, active, thermic Typic Haplustepts
Vinson-----	Fine-silty, mixed, superactive, thermic Entic Haplustolls
Wellsford-----	Clayey, mixed, active, thermic, shallow Typic Haplustepts
Westola-----	Coarse-loamy, mixed, superactive, calcareous, thermic Typic Ustifluvents
Woods-----	Fine, smectitic, thermic Typic Calciusterts
Woodward-----	Coarse-silty, mixed, superactive, thermic Typic Haplustepts
Yomont-----	Coarse-silty, mixed, superactive, calcareous, thermic Typic Ustifluvents





# Formation of the Soils

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This section describes the factors of soil formation and how they relate to the soils in Harper County. It also describes the landscape evolution and surface geology of the county.

## Factors of Soil Formation

The five factors that affect formation of the soils are climate, living organisms, topography, parent material, and time. The combined influence of these factors determines the characteristics and properties of the soils

### Climate

Harper County has a dry, subhumid climate. The climate is fairly uniform throughout the county; differences between soils cannot be attributed to differences in climate based on the present climatic regime. The temperatures and amount of moisture have been sufficient to promote the formation of distinct layers in many of the soils. Soil leaching is slow to moderate. The physical abrasion and redistribution of materials by wind action contributes to soil formation. Cold temperatures occur often enough and long enough for freezing and thawing to alter materials.

### Living Organisms

Plants, burrowing animals, insects, and microorganisms have a direct influence on the formation of soils. Differences among native grasses and woody plants in the county have resulted in differential losses and gains of organic matter and plant nutrients and in differences in soil structure and porosity. Soils that formed under prairie vegetation, such as those of the St. Paul and Tipton series, have a dark grayish brown surface layer and a moderately high content of organic matter. Soils that formed under woody vegetation, such as those of the Devol series, have a brown surface layer and a low content of organic matter.

### Topography

Relief influences the formation of the soils mainly by affecting water movement, erosion, soil temperature, and kind of plant cover. In Harper County, the resistance of underlying formations to weathering and geological erosion determines relief. The western part of Harper County has a fairly level, stable topography, and the soil forming processes are more intense than in the eastern part. The soils in the western part of the county are deep and more developed. The more dissected topography of the eastern part has more runoff and erosion, and the residual soils are moderately deep or shallow and less developed. The soils that formed from ancient fluvial sediments are generally less sloping and more developed.

## Parent Material

Soils form in unconsolidated material that influences the rate of formation; the chemical, physical, and mineral composition of the soil; and the color of the soil.

Soils on the uplands in Harper County formed in material weathered from sandstone, clay, shale, gypsum, and dolomite.

Soils in the High Plains Border area in the western part of the county formed in an admixture of unconsolidated limy material.

Alluvial sediment is extensive along the streams and rivers in the county. The kind of sediment deposited and the kinds of soil that formed in it depend largely on the source of the sediment and the velocity of the streams. Examples of soils that formed in ancient fluvial sediments are Abilene, Frankirk, Selman, St. Paul, and Tipton soils. Examples of soils that formed in recent fluvial sediments are Lesho, Lincoln, Westola, and Yomont soils.

## Time

As a factor in soil formation, time is not strictly a matter of years. The length of time needed for development of genetic horizons depends on the intensity and interactions of soil-forming factors in promoting the losses, gains, transfers, or transformations of the constituents necessary in forming soil horizons. Soils that have no definite genetic horizons are young or immature. Mature or older soils have approached equilibrium with their environment and tend to have well defined horizons.

The soils in Harper County range from young to old. Woods and Abilene soils are examples of old soils. Selman soils are younger, but they have well expressed horizons. Quinlan and Woodward soils are considered young soils. They have had sufficient time to develop well-expressed horizons; but, because the soils are sloping, geological erosion has taken away soil material almost as fast as it was formed. Lincoln and Westola soils are young soils that formed in recent sediments on flood plains and show little horizon development.

## Landscape Evolution and Surface Geology

By Gregory F. Scott, soil scientist/project leader, USDA, Natural Resources Conservation Service

The present landscape is dynamic and is the product of many years of erosion and deposition by water and wind. Over the last 2 million years, climatic changes associated with ice ages have resulted in intense periods of erosion and deposition interspersed with long periods of landscape stability (Buol, Hole, and McCracken, 1973; Fay, 1964; Fay, 1965; Johnson et al., 1972; and Morton, 1970).

## Landscape Evolution

The Surface Geology Map of Harper County (fig. 19) shows a pattern of outcrops of progressively older geologic formations from west to east. The formations range from Permian through Cretaceous age and are associated with erosional downcutting in the Cimarron River valley. The North Canadian River and Cimarron River, which are the major rivers in the county, flow generally southeastward across the county. They have greatly influenced the development of the present-day landscape. Another influence has been the prevailing southwest winds, which have blown sandy sediments out of river valleys and deposited the sediments along the northern sides of rivers and creeks.

During the Pleistocene and Holocene, rivers eroded the landscape and deposited flood plains. Rejuvenation caused the rivers to migrate, cut deeper valleys, and deposit flood plains associated with the stream level of the time. Cycles of

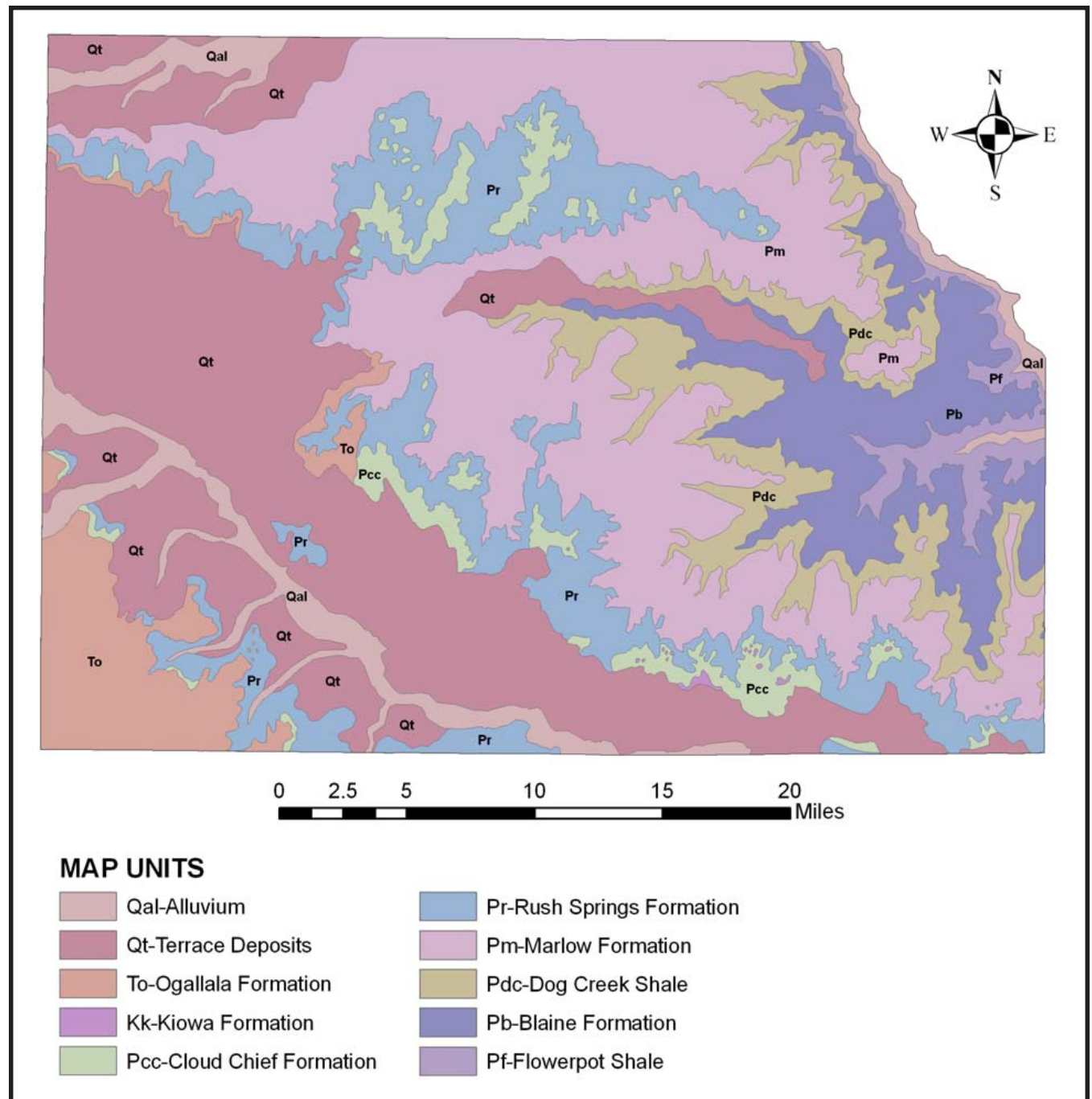


Figure 19.—Surface geology map of Harper County, Oklahoma.

rejuvenation led to several terrace levels along the major rivers. The flow of the rivers varied with the cycle of the ice ages, at times carrying huge volumes of water and sediment as the climate responded to the influence of ice in the north and west. Over the past million years, rivers have even changed course as small streams pirated large ones, carving new valleys and leaving old valleys “high and dry” with small underfit streams in their place. Rivers and streams eroded the Ogallala and Permian Formations, leaving behind smears of sediments on various terrace levels.

The stratigraphic sequence of hard (erosion-resistant) and soft (erosive) bedrock in geologic formations of Permian age has given rise to numerous escarpments and hills, the harder dolomite, sandstone, and gypsum being more resistant to water erosion than underlying shale. In addition, the dip of Permian rocks toward the Anadarko Basin influences rivers to migrate southwest along the dip. This combination of bedrock type and stream drainage patterns produced the high bluff on the south side of the Cimarron River.

Tertiary sediments are mostly unconsolidated and were originally deposited as far east as Oklahoma City. Geologic erosion removed Tertiary sediments (of the Ogallala and Laverne Formations), except in the western part of the county.

During arid periods, prevailing southwest winds moved sandy sediments from riverbeds and streambeds. The sands were deposited directly to the north of generally east-west trending river systems, creating bands of sandhills on the northern sides of rivers. The sandhills north of the Cimarron and North Canadian Rivers cover an area several miles wide from north to south and are contiguous across the county from east to west. Episodic deposition of eolian sands alternated with periods of soil formation. The degree of profile development in soils that formed in windblown sand reflects the landscape stability (and possibly age) of the sand deposit.

Today's landscape contains evidence and clues about many of the forces that formed the landscape that we see today. Each river has operated over time more or less independently, although stream piracy during the Pleistocene captured tributaries from the North Canadian River and added their watersheds to the drainage network of the Cimarron River. Several deposits of volcanic ash occur in Harper County where rainfall events concentrated ash after a volcanic eruption. Ash deposits are datable and correlate to past events, such as the Yellowstone caldera eruption. Dating volcanic ash provides the age of the stream terrace level and sediment in which the ash occurs.

## Surface Geology

The surface geology of Harper County is fairly complex (fig. 19). Outcropping rocks of Permian and Cretaceous age in western Harper County are unconformably overlain by weakly consolidated and unconsolidated alluvium in the Ogallala and Laverne Formations of Pliocene (late Tertiary) age. In the eastern part of the county and along the North Canadian and Cimarron Rivers, Permian rocks are unconformably overlain by unconsolidated Quaternary alluvium laid down by ancient or modern rivers and streams. Permian sandstones, Tertiary and Pleistocene sediments, and Holocene alluvium are sources of ground water. The yields and quality of ground water from these aquifers varies greatly across the county.

The outcropping rocks and sediments overlie older sedimentary rocks that are important reservoirs for oil and gas production. Subsurface Paleozoic sedimentary rocks in Harper County are about 8,000 to 10,000 feet thick. These sedimentary rocks were deposited in seas that bordered the deep sedimentary basins of central Oklahoma (Anadarko Basin to the southwest and Arkoma Basin to the southeast) and overlie granite bedrock in the North American Craton. These seas inundated the Harper County area intermittently from Cambrian time (about 525 million years before present) through Cretaceous time (about 65 million years before present). Harper County is in the geologic province of Oklahoma known as the Northern Shelf Area.

Soil parent materials are generally the product of weathering and disaggregation of outcropping rock units. As such, there is a close relationship between the physical and chemical properties of the rock formations and the soils that develop upon them. A description of the rock units, therefore, helps to explain the character and distribution of the soils.

## Permian Period

The Permian red beds and gypsum of Harper County were laid down during mid to late Permian time (about 240 to 260 million years before present). The various Permian geologic formations, including (from older to younger) the Flowerpot Shale, Blaine Formation, Dog Creek Shale, Whitehorse Group (with the Rush Springs Sandstone), and Cloud Chief Formation, conformably overlie each other. Outcropping rocks typically are red or reddish-brown with local color variations to light gray or greenish gray. The red color results from iron oxides (typically hematite) coating the individual particles that make up the rock. The grayish colors of some of the shales and sandstones are likely a result of reduction of iron by bacteria in the presence of organic matter shortly after deposition. Soils that formed from reddish rocks tend to retain the hematite stain of the parent material, thus explaining the red color of many soils in Harper County.

The oldest Permian rocks in Harper County crop out along the eastern boundary of the county and are overlain by successively younger Permian, Cretaceous, Tertiary, and Quaternary strata to the west. Outcropping Permian rocks dip gently southwestward across the county towards the Anadarko Basin at an angle of less than 1 degree or an average of 4 to 10 feet per mile.

The Flowerpot Shale is the oldest bedrock exposed in Harper County. Only the upper 60 feet of the Flowerpot Shale is exposed in Harper County. It crops out in the bluffs along Buffalo Creek and the Cimarron River. The Flowerpot Shale is primarily reddish-brown, gypsiferous shale with a few thin beds of sandstone and siltstone. Intersecting veins of selenite and satin spar gypsum are common. Vernon, Vinson, and Cottonwood soils formed in material weathered from rocks of the Flowerpot Shale. Most of the exposed Flowerpot Shale in Harper County is mantled with Pleistocene alluvium.

The Blaine Formation overlies the Flowerpot Shale and crops out in Harper County as a band ranging from 1 to 4 miles in width. The Blaine Formation is about 90 feet thick and consists of four gypsum members, each with a basal dolomite, separated by shale members that can range to 20 feet in thickness. The four gypsum members, from oldest to youngest, are the Medicine Lodge, Nescatunga, Shimer, and Haskew. In many localities, the gypsum beds have been removed by dissolution and only the basal dolomite remains. The gypsum and dolomite beds tend to form prominent escarpments that are visible along the Cimarron River and Buffalo Creek. Reserves of recoverable gypsum from the Blaine Formation have not been estimated but are considerable. The composite thickness of the four gypsum members in Harper County is about 55 feet. Similar to the Flowerpot Shale, Vernon soils formed in material weathered from shales in this unit and Cottonwood and Vinson soils formed in material weathered from gypsum. Small areas of Talpa soils formed in residuum weathered from dolomite with claystone or shale interbeds.

The Dog Creek Shale overlies the Blaine Formation. It crops out as a narrow band that is generally 0.25 to 0.5 mile wide but can range up to 3 miles in width. It averages about 50 feet in thickness and is primarily reddish-brown, gypsiferous shale with thin beds of siltstone, dolomite, gypsum, and sandstone. The Dog Creek Shale is lithologically similar to the Blaine Formation, and similar soils form on each unit. In the Dog Creek Shale, Woodward and Quinlan soils formed in material weathered from siltstones and sandstones, Cottonwood and Vinson soils formed in material weathered from gypsum beds, and Vernon soils formed in material weathered from shale.

The Whitehorse Group consists of the Marlow Formation and Rush Springs Sandstone. These two formations are typically mapped together as Whitehorse Group, undivided. The Whitehorse Group is about 200 feet thick, the lower 60 feet constituting the Marlow formation and the upper 140 feet the Rush Springs Sandstone. The Marlow Formation is primarily fine grained, orange-brown sandstone



with about 20 feet of reddish brown shale in the upper part. The Rush Springs Sandstone is characterized by red, fine grained sandstones and siltstones with reddish-brown shale and gypsum beds. Woodward, Quinlan, and Deepwood soils are the primary soils that formed in material weathered from the sandstone.

The Cloud Chief Formation is the uppermost (youngest) Permian formation in Harper County and occurs as isolated outliers in the north-central, central, and southeastern parts of the county. These outliers are on divides between the Cimarron River and Buffalo Creek and between Buffalo Creek and the North Canadian River. The Cloud Chief Formation consists of dark red shale with a few thin gypsum interbeds. It is underlain by the Day Creek Dolomite. The Day Creek Dolomite is about 2.5 feet thick, and the Cloud Chief Formation in Harper County has a maximum thickness of 30 feet. Quinlan soils and the Rock outcrop miscellaneous area are mapped on this geologic formation. Vernon soils formed in materials weathered from shale, and Talpa soils formed in residuum weathered from the Day Creek Dolomite. A few areas of Cottonwood and Vinson soils formed in material weathered from gypsum.

### **Cretaceous Period**

The Cretaceous Period is represented by the Kiowa Shale and is mapped only in very limited exposures in the southeastern quarter of the county. The Kiowa Shale overlies the Cloud Chief Formation and crops out on the divide between the North Canadian River and Buffalo Creek. The Kiowa Shale primarily consists of gray shale grading into yellow sandstone at the base. It also includes interbeds of indurated sandstones and thin, white, chalky limestones. The maximum thickness of this geologic formation in Harper County is about 52 feet, and only the basal section is exposed. Wellsford and Teagard soils formed in material weathered from Cretaceous shale.

### **Tertiary Period**

The Tertiary Period is represented by the Ogallala and Laverne Formations, which unconformably mantle Permian and Cretaceous rocks in the western part of the county. These formations were deposited by rapidly aggrading rivers as part of an alluvial plain on the eastern flank of the Rocky Mountains. Only the basal members of the Ogallala and Laverne Formations are present in Harper County. These stratified alluvial parent sediments have pedogenic accumulations of calcium carbonate (caliche) and reach a maximum thickness of 35 feet. The basal unit in both formations is very gravelly and in places is cemented into mortar beds. The land surface associated with these formations is highly dissected, and the soils are quite variable. Berda, Likes, Mobeetie, Mansic, Oklark, and Paloduro soils formed in loamy and/or sandy sediments in the Ogallala and Laverne Formations.

The Meade Formation of Pleistocene age is mapped over a small area north of the towns of Rosston and Doby Springs in the northwestern part of the county. Soils that formed in parent sediments from the Meade Formation are so similar to soils that developed in Ogallala and Laverne sediments that it was not practical to separate them in figure 20.

### **Quaternary Period**

The Quaternary Period, including the Pleistocene and Holocene Epochs, is represented by stream terraces and sandy eolian deposits and by Holocene flood plain sediments related to present-day river systems.

*Quaternary Stream Terraces, Qt5–Qt1.*—Five Quaternary terrace levels, related to ancient river systems, are shown in figure 21. Each terrace level is mapped separately, being distinct in character, stratigraphy, elevation, age, and soil mapping units. The Quaternary deposits are widespread and cover about 40 percent of the

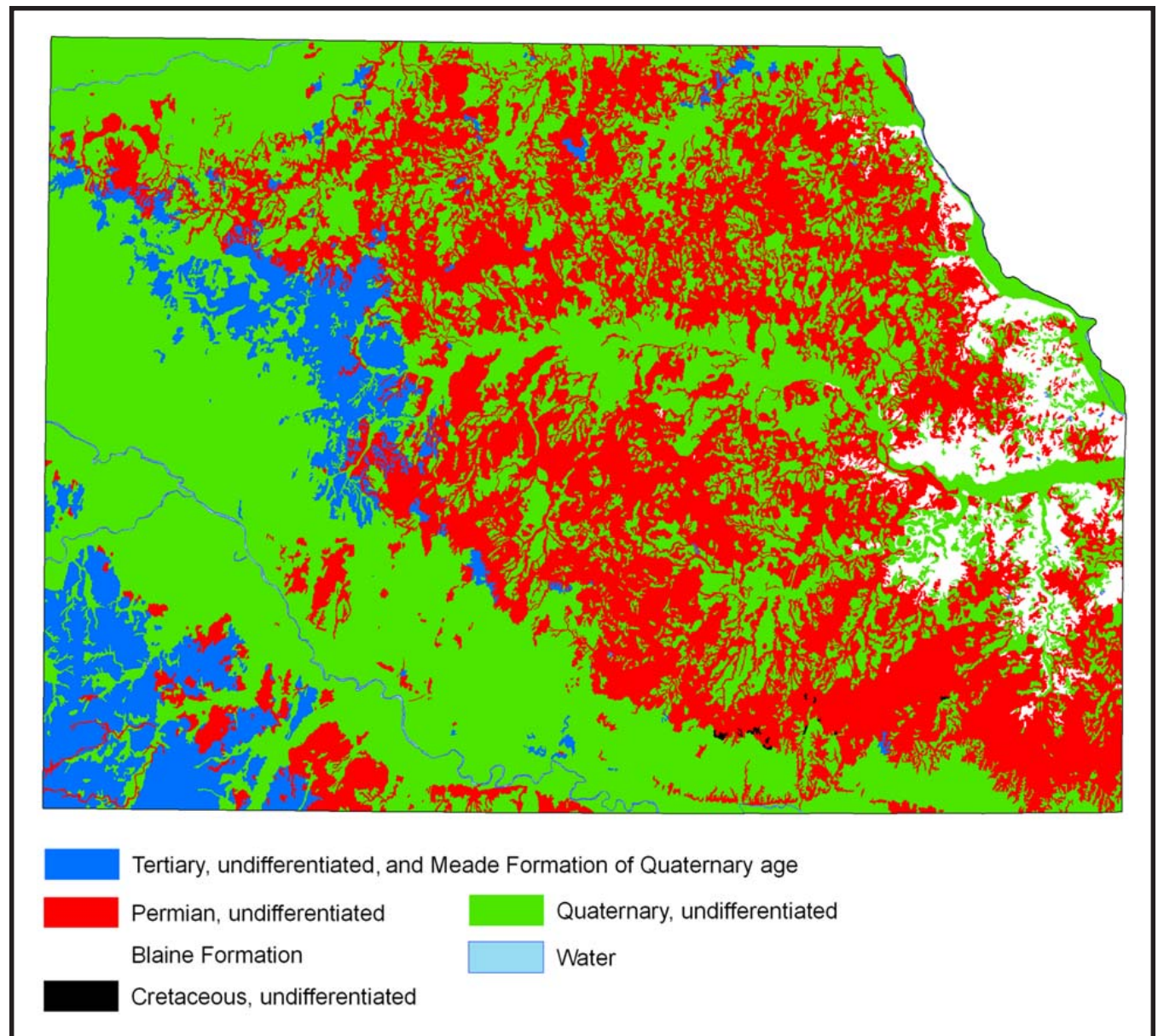


Figure 20.—SSURGO-based representation of surface geology in Harper County, Oklahoma. This map was generated by combining soil delineations that have similar parent materials for given geologic ages.

county. They are economically important. Sixty percent of the cropland in the county is on Quaternary terrace deposits.

The *Qt5* terrace is the highest and oldest stream terrace in Harper County. It is mapped only on the summit of the divide between the North Canadian River and Buffalo Creek/Cimarron River. This terrace is probably early Pleistocene but may be late Pliocene. Due to the limited extent of the *Qt5* terrace, this level is difficult to date. Woods soils, which are primarily mapped on the *Qt5* terrace, formed in clayey alluvium with smectitic mineralogy and are classified as Typic Calciusterts.

The *Qt4* terrace is the next lower (and younger) stream terrace and occurs in the large river valley between the Cimarron River and the North Canadian River, northwest of the town of Rosston. This relict river valley is the site of an ancient



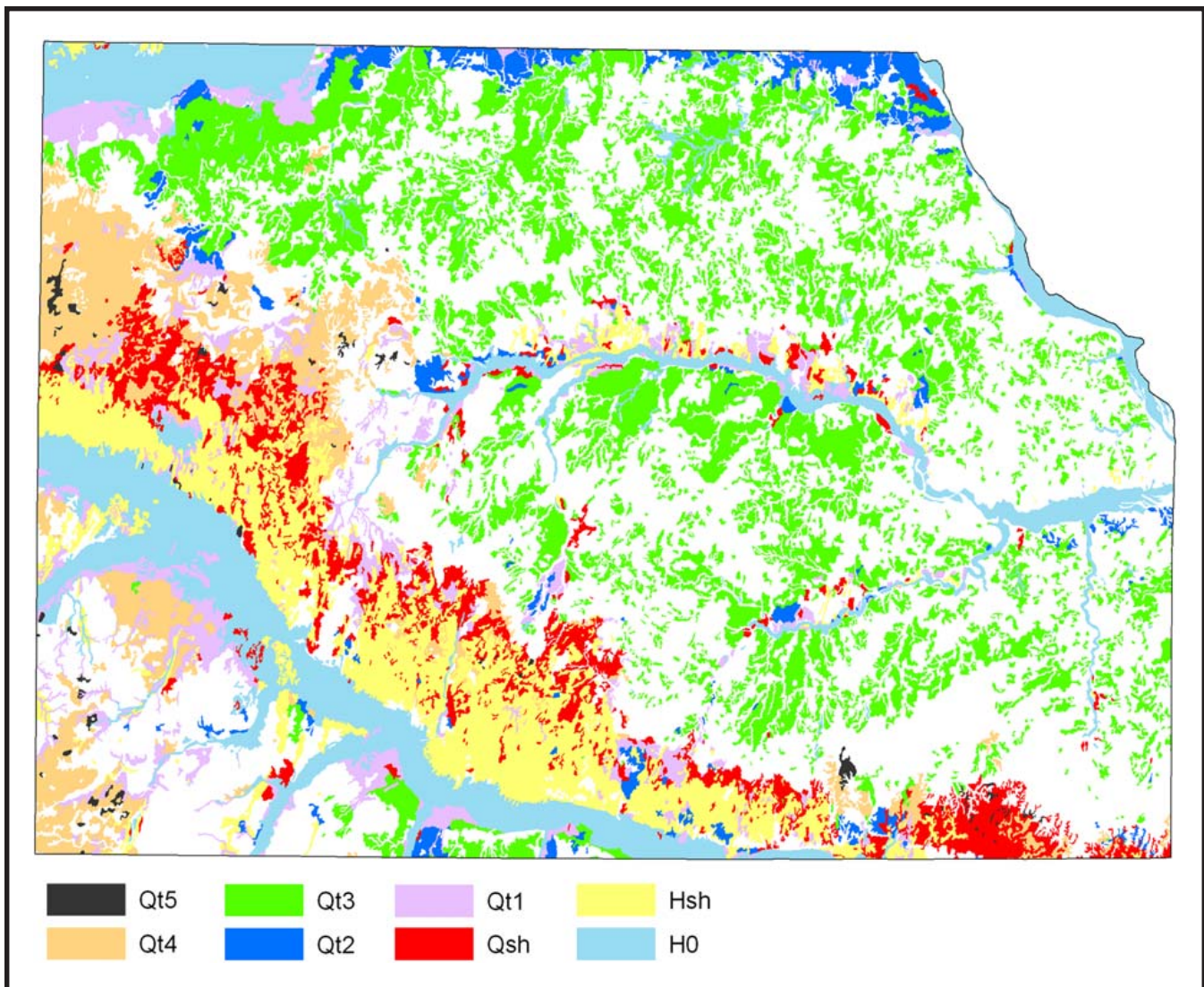


Figure 21.—SSURGO-based representation of geomorphic surfaces and parent sediments of Quaternary age in Harper County, Oklahoma. This map was generated by combining soil delineations for each of the different geomorphic surfaces and parent materials, including stream terraces, eolian sand deposits, and flood plain sediments

stream piracy. Another large area of Qt4 is in the southeastern quarter of the county on the divide between the North Canadian River and Buffalo Creek/Cimarron River (similar to the Qt5 terrace). The Meade Formation covers a portion of this area. Texroy, Abbie, Irene, Manson, and Plemons soils are on the Qt4 terrace. Texroy, Abbie, and Irene soils formed in loamy and/or silty alluvium, have secondary calcium carbonate, and are classified as Argiustolls. Manson and Plemons soils are classified in Calcic subgroups. They have a high content of calcium carbonate that reflects both their close association with, and derivation from, Ogallala sediments and sufficient time to form well-developed calcic horizons.

The Qt3 terrace is the mid-level stream terrace and is very extensive across the county. It occurs on the north side of the Cimarron River/North Canadian River divide, in the drainage area of Buffalo Creek, and in association with the Cimarron River. St. Paul, Selman, and Frankirk soils are mapped on the Qt3 terrace. They formed in silty and/or loamy alluvium. These soils are classified as Argiustolls. The St. Paul and



Selman soils have insufficient secondary calcium carbonate to qualify as having a calcic horizon.

The *Qt2* terrace is a lower stream terrace that occurs along the Cimarron River in the northwestern corner of the county in the Paruna area. *Qt2* is a younger terrace and has a low drainage density. Tipton, Farry, and Fortyone soils are on the *Qt2* terrace. They formed in loamy and/or sandy alluvium. Tipton and Farry soils are classified as Argiustolls. Fortyone soils are classified as Haplustalfs. Argillic horizons in these soils are not as strongly developed as those in soils on older terraces. Also, these soils have minimal amounts of secondary calcium carbonate.

The *Qt1* terrace is the lowest (and youngest) stream terrace. It occurs along the Cimarron River. Soils on this terrace level do not have an argillic horizon and have very minimal accumulations of secondary calcium carbonate. Kingsdown and Hardeman soils developed in sandy alluvium and are classified as Entic Haplustolls and Typic Haplustepts, respectively.

*Quaternary Eolian Sand Deposits, Qsh and Hsh.*—The *Qsh* deposits represent gently sloping eolian sand deposits of Pleistocene age. In general, sand sheet deposits farther from the sand source are older, are higher in elevation, and have more advanced soil profile development than younger deposits. Grandfield, Grandmore, and Devol soils developed on these Pleistocene sand sheets. These soils formed in loamy and/or sandy alluvium, have an argillic horizon, and are classified as Typic Haplustalfs. Local, episodic remobilization of the sand sheets during drought conditions causes the formation of a complex spatial pattern of older and younger soils. As a result of sand movement, partially truncated soils are exposed to surface weathering. Buried soils and lithologic discontinuities (regularly related to terrace levels) are common in *Qsh* sand deposits.

The *Hsh* deposits represent sand hills and sand deposits of Holocene age (10,000 years before present to present). These sand hills are close to the source of this material, generally less than 2 miles from the river. Eda and Tivoli soils developed on these Holocene sands and have very minimal soil profile development. Eda soils show minimal evidence of clay movement (lamellae), and both soils are classified as Ustipsamments. In places, these sand deposits overlie buried soils that developed on older stream terrace levels and Grandfield and Grandmore soils are exposed on interdunes where the *Hsh* deposits are thinner.

*Holocene Flood Plains, H0.*—The *H0* deposits consist of recent deposits of unconsolidated alluvium on flood plains along present-day rivers and streams, such as the Cimarron and North Canadian Rivers and Buffalo Creek and its tributaries. The characteristics of soils on flood plains, including texture and mineralogy, are primarily dependent on their provenance, which is the contributing drainage area from which the sediments are derived. Other factors affecting the character of such soils are the size of the drainage area, gradient of the stream, and volume of flow. Gracemore, Lincoln, Westola, Lugert, Lesho, and Yomont soils formed in sandy alluvium on flood plains in Harper County. Jester soils formed in sandy alluvium that was reworked by wind into dunes adjacent to flood plains.

### **Correlation Between Terrace Age and Soil Development**

An accepted concept of landscape development is that the oldest stream terraces are highest on the landscape. Rivers first deposit the oldest terraces and then deposit successively younger terrace levels at lower elevations. As a result, the oldest terraces are exposed to weathering and soil-forming processes longer than younger terraces. The degree of soil profile development should correspond, to some extent, with the age of the terrace level. The most obvious pedogenic processes occurring on these terraces include:

1. Eluviation (removal of soil material, most notably clay, from surface layers),
2. Illuviation (addition of soil material, most notably clay, into the subsoil),

3. Melanization (addition of organic matter and darkening of the soil surface),
4. Leaching (removal of soluble materials from one horizon to another by water movement),
5. Pedoturbation (biological and physical mixing of soil material, homogenizing the solum),
6. Calcification (accumulation of calcium carbonate in the subsoil), and
7. Cumulization (accumulation by air or water of mineral particles, including calcium carbonate, onto the soil surface).

The degree of development of soil horizons reflects the time over which these processes have been operating. A thin argillic horizon with minimal clay accumulation is likely younger than a thick argillic horizon with high percentage of illuviated clay. Younger, less stable land surfaces typically have lower a content of organic matter than older, more stable land surfaces. Older, more well developed soils may also have a high percentage of organic matter illuviated deeper into the solum. Pedoturbation eliminates stratification from sedimentary deposits. Calcification creates calcic horizons in the subsoil. Older soils typically have thick calcic horizons with high percentages of secondary calcium carbonate. Some of the oldest surfaces also experience re-calcification through the process of cumulization during arid periods when calcareous dust is added to soil profiles by wind-derived dust or rainfall.

Table 26 shows a high correlation Between terrace level (and corresponding elevation), the degree of soil development, and soil classification. Individual soil series in Harper County occupy distinct terrace levels, reflecting their age, parent material, and topography. Differences between soils on a terrace level reflect differences in topography and depositional facies within the parent material. The soils on the sand hills, while younger than the Pleistocene terraces, commonly are adjacent to and topographically higher than the terraces. Mobilization of the landscape during drought moved and re-deposited the sands. Differences between the Qsh and Hsh units reflect distinct events separated in time. The Qsh sand hills have had time to develop argillic horizons.

Table 26.--Relationships Between Quaternary Terrace Level, Soil Classification, and Particle-Size Class

Terrace	Soil Classification	Soil Series	Particle-Size Class
Qt5	Typic Calciusterts	Woods	Fine
Qt4	Calcic Paleustolls	Manson	Fine-loamy
	Calcic Paleustalfs	Plemons	Fine-loamy
	Pachic Argiustolls	Texroy	Fine-loamy
	Pachic Argiustolls	Irene	Fine-silty
	Aridic Argiustolls (shallower secondary carbonates, well developed calcic horizon compared to Qt3)	Abbie	Fine-loamy
Qt3	Pachic Argiustolls	St. Paul	Fine-silty
	Typic Argiustolls	Selman	Fine-silty
	Typic Argiustolls	Frankirk	Fine
	(well developed soil compared to Qt2)		
Qt2	Pachic Argiustolls	Tipton	Fine-loamy
	Typic Haplustalfs	Fortyone	Coarse-loamy
	Typic Argiustolls	Farry	Fine-loamy
	(weakly developed soil compared to Qt3)		
Qt1	Entic Haplustolls	Kingsdown	Coarse-loamy
	Typic Haplustepts (no argillic horizon, not stratified)	Hardeman	Coarse-loamy
Qsh	Typic Haplustalfs	Devol	Coarse-loamy
	Typic Haplustalfs	Grandfield	Fine-loamy
	Typic Haplustalfs	Grandmore	Fine-loamy
	(continuous argillic horizon)		
Hsh	Lamellic Ustipsamments	Eda	Sandy
	Typic Ustipsamments	Tivoli	
	Aridic Ustipsamments	Likes	
	(weak argillic or none)		
HO	Typic Ustifluvents	Lincoln	Sandy, stratified
	Typic Ustifluvents (calcareous)	Westola	Coarse-loamy, stratified
	Typic Ustifluvents (calcareous)	Yomont	Coarse-silty, stratified



## References

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- American Association of State Highway and Transportation Officials (AASHTO). 1998. Standard specifications for transportation materials and methods of sampling and testing. 19th edition, 2 volumes.
- American Society for Testing and Materials (ASTM). 1998. Standard classification of soils for engineering purposes. ASTM Standard D 2487.
- Buol, S.W., F.D. Hole, and R.J. McCracken. 1973. Soil genesis and classification.
- Fay, Robert O. 1964. The Blaine and related Formations of northwestern Oklahoma and southern Kansas. Oklahoma Geological Survey Bulletin 98.
- Fay, Robert O. 1965. Geology and mineral resources of Harper County, Oklahoma. Oklahoma Geological Survey Bulletin 106.
- Johnson, Kenneth S., Carl C. Branson, Neville M. Curtis, Jr., William E. Ham, William E. Harrison, Melvin V. Marcher, and John F. Roberts, 1972. Geology and earth resources of Oklahoma: An atlas of maps and cross sections. Oklahoma Geological Survey Educational Publication 1.
- Morton, Robert B. 1980. Reconnaissance of the water resources of the Woodward Quadrangle, northwestern Oklahoma. Oklahoma Geological Survey Hydrologic Atlas 8, scale 1:250,000.
- Soil Survey Division Staff. 1993. Soil survey manual. U.S. Department of Agriculture Handbook 18.
- Soil Survey Staff. 1998. Keys to soil taxonomy. 8th edition. United States Department of Agriculture, Natural Resources Conservation Service.
- Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U. S. Department of Agriculture Handbook 436.
- United States Department of Agriculture. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.
- United States Department of Agriculture, Natural Resources Conservation Service. 1996. Soil survey laboratory methods manual. Soil Survey Investigations Report 42.
- United States Department of Agriculture, Soil Conservation Service. 1960. Soil Survey of Harper County, Oklahoma.



# Glossary

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**Aeration, soil.** The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

**Aggregate, soil.** Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

**Alkali (sodic) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Alluvium.** Material, such as gravel, sand, silt, or clay, deposited on land by streams.

**Alpha,alpha-dipyridyl.** A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

**Animal unit month (AUM).** The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

**Aquic conditions.** Current soil wetness characterized by saturation, reduction, and redoximorphic features.

**Area reclaim** (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

**Argillic horizon.** A subsoil horizon characterized by an accumulation of illuvial clay.

**Aspect.** The direction in which a slope faces.

**Association, soil.** A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

**Available water capacity (available moisture capacity).** The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low .....	0 to 3
Low .....	3 to 6
Moderate .....	6 to 9
High .....	9 to 12
Very high .....	more than 12

**Backslope.** The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Backslopes in profile are commonly steep, are linear, and may or may not include cliff segments.

**Badland.** Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

- Base saturation.** The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.
- Bedding planes.** Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.
- Bedrock.** The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.
- Bench terrace.** A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.
- Blowout.** A shallow depression from which all or most of the soil material has been removed by wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.
- Bottom land.** The normal flood plain of a stream, subject to flooding.
- Boulders.** Rock fragments larger than 2 feet (60 centimeters) in diameter.
- Breaks.** The steep and very steep broken land at the border of an upland summit that is dissected by ravines.
- Brush management.** Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.
- Butte.** An isolated small mountain or hill with steep or precipitous sides and a top variously flat, rounded, or pointed that may be a residual mass isolated by erosion or an exposed volcanic neck.
- Calcareous soil.** A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.
- Caliche.** A more or less cemented deposit of calcium carbonate in soils of warm-temperate, subhumid to arid areas. Caliche occurs as soft, thin layers in the soil or as hard, thick beds directly beneath the solum, or it is exposed at the surface by erosion.
- Canyon.** A long, deep, narrow, very steep sided valley with high, precipitous walls in an area of high local relief.
- Capillary water.** Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.
- Catena.** A sequence of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.
- Cation.** An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.
- Cation-exchange capacity.** The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.
- Cemented.** Material in an air-dry test specimen that does not slake after being immersed in water for 1 hour. Cemented soil material has a brittle, hard consistence caused by some cementing agent other than clay. Calcium carbonate, silica, or oxides or salts of iron and aluminum are common cementing materials.



- Channeled.** Refers to a drainage area in which natural meandering or repeated branching and convergence of a streambed have created deeply incised cuts, either active or abandoned, in alluvial material.
- Channery soil material.** Soil material that is, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a chanter.
- Chemical treatment.** Control of unwanted vegetation through the use of chemicals.
- Chiseling.** Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.
- Clay.** As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.
- Clay depletions.** Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.
- Clayey soil.** Silty clay, sandy clay, or clay.
- Clay film.** A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. *Synonyms:* clay coating, clay skin.
- Claypan.** A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.
- Climax plant community.** The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.
- Closed depression.** A low area completely surrounded by higher ground and having no natural outlet.
- Coarse fragments.** Mineral or rock particles larger than 2 millimeters in diameter.
- Coarse textured soil.** Sand or loamy sand.
- Cobble (or cobblestone).** A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.
- Cobbly soil material.** Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.
- Colluvium.** Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.
- Complex slope.** Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.
- Complex, soil.** A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.
- Concretions.** Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.
- Conglomerate.** A coarse grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.
- Conservation cropping system.** Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-

improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

**Conservation tillage.** A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

**Consistence, soil.** Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

**Consolidated sandstone.** Sandstone that disperses within a few hours when fragments are placed in water. The fragments are extremely hard or very hard when dry, are not easily crushed, and cannot be textured by the usual field method.

**Consolidated shale.** Shale that disperses within a few hours when fragments are placed in water. The fragments are extremely hard or very hard when dry and are not easily crushed.

**Consolidated siltstone.** Siltstone that disperses within a few hours when fragments are placed in water. The fragments are extremely hard or very hard when dry and are not easily crushed.

**Contour stripcropping.** Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

**Control section.** The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

**Coppice dune.** A small dune of fine grained soil material stabilized around shrubs or small trees.

**Corrosion.** Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

**Cover crop.** A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

**Cropping system.** Growing crops according to a planned system of rotation and management practices.

**Crop residue management.** Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

**Cuesta.** A hill or ridge that has a gentle slope on one side and a steep slope on the other; specifically, an asymmetric, homoclinal ridge capped by resistant rock layers of slight or moderate dip.

**Cutbanks cave** (in tables). The walls of excavations tend to cave in or slough.

**Decreasers.** The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

**Deep soil.** A soil that is 40 to 60 inches deep over bedrock or to other material that restricts the penetration of plant roots.

**Deferred grazing.** Postponing grazing or resting grazing land for a prescribed period.

**Depth, soil.** Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately

deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

**Depth to rock** (in tables). Bedrock is too near the surface for the specified use.

**Dip slope.** A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

**Diversion (or diversion terrace).** A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

**Drainage class (natural).** Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained*, *somewhat excessively drained*, *well drained*, *moderately well drained*, *somewhat poorly drained*, *poorly drained*, and *very poorly drained*. These classes are defined in the “Soil Survey Manual.”

**Drainage, surface.** Runoff, or surface flow of water, from an area.

**Drainageway.** An area of ground at a lower elevation than the surrounding ground and in which water collects and is drained to a closed depression or lake or to a drainageway at a lower elevation. A drainageway may or may not have distinctly incised channels at its upper reaches or throughout its course.

**Draw.** A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

**Dune.** A mound, ridge, or hill of loose, windblown granular material (generally sand), either bare or covered with vegetation.

**Eluviation.** The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

**Endosaturation.** A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

**Eolian soil material.** Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

**Ephemeral stream.** A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

**Episaturation.** A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

**Erosion.** The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

*Erosion (geologic).* Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains.  
Synonym: natural erosion.

*Erosion (accelerated).* Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

**Escarpment.** A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

**Fallow.** Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

- Fertility, soil.** The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.
- Fibric soil material (peat).** The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.
- Field moisture capacity.** The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called normal field capacity, normal moisture capacity, or capillary capacity.
- Fine textured soil.** Sandy clay, silty clay, or clay.
- First bottom.** The normal flood plain of a stream, subject to frequent or occasional flooding.
- Flaggy soil material.** Material that is, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.
- Flagstone.** A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.
- Flood plain.** A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.
- Fluvial.** Of or pertaining to rivers; produced by river action, as a fluvial plain.
- Footslope.** The inclined surface at the base of a hill.
- Forb.** Any herbaceous plant not a grass or a sedge.
- Genesis, soil.** The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.
- Gilgai.** Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.
- Gleyed soil.** Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.
- Grassed waterway.** A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.
- Gravel.** Rounded or angular fragments of rock as much as 3 inches (7.6 centimeters) in diameter. An individual piece is a pebble.
- Gravelly soil material.** Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter. Very gravelly soil material has 35 to 60 percent of these rock fragments, and extremely gravelly soil material has more than 60 percent.
- Green manure crop (agronomy).** A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.
- Ground water.** Water filling all the unblocked pores of the material below the water table.
- Gully.** A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.
- Gypsum.** A mineral consisting of hydrous calcium sulfate.
- Hard bedrock.** Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

**Hardpan.** A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

**Heavy metal.** Inorganic substances that are solid at ordinary temperatures and are not soluble in water. They form oxides and hydroxides that are basic. Examples are copper, iron, cadmium, zinc, manganese, lead, and arsenic.

**Hemic soil material (mucky peat).** Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

**High-residue crops.** Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

**Hill.** A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

**Horizon, soil.** A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

*O horizon.*—An organic layer of fresh and decaying plant residue.

*A horizon.*—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

*E horizon.*—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

*B horizon.*—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

*C horizon.*—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

*Cr horizon.*—Soft, consolidated bedrock beneath the soil.

*R layer.*—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

**Humus.** The well decomposed, more or less stable part of the organic matter in mineral soils.

**Hydrologic soil groups.** Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.



**Igneous rock.** Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

**Illuviation.** The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

**Impervious soil.** A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

**Increasers.** Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

**Infiltration.** The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

**Infiltration capacity.** The maximum rate at which water can infiltrate into a soil under a given set of conditions.

**Infiltration rate.** The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

**Intake rate.** The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2 .....	very low
0.2 to 0.4 .....	low
0.4 to 0.75 .....	moderately low
0.75 to 1.25 .....	moderate
1.25 to 1.75 .....	moderately high
1.75 to 2.5 .....	high
More than 2.5 .....	very high

**Intermittent stream.** A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

**Invaders.** On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

**Iron depletions.** Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

**Irrigation.** Application of water to soils to assist in production of crops. Methods of irrigation are:

*Basin.*—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

*Border.*—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

*Controlled flooding.*—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

*Corrugation.*—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

*Drip (or trickle).*—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

*Furrow.*—Water is applied in small ditches made by cultivation implements.

Furrows are used for tree and row crops.

*Sprinkler.*—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

*Subirrigation.*—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

*Wild flooding.*—Water, released at high points, is allowed to flow onto an area without controlled distribution.

**Knoll.** A small, low, rounded hill rising above adjacent landforms.

**Lacustrine deposit.** Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

**Leaching.** The removal of soluble material from soil or other material by percolating water.

**Liquid limit.** The moisture content at which the soil passes from a plastic to a liquid state.

**Loam.** Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

**Loamy soil.** Coarse sandy loam, sandy loam, fine sandy loam, very fine sandy loam, loam, silt loam, silt, clay loam, sandy clay loam, or silty clay loam.

**Low-residue crops.** Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

**Low strength.** The soil is not strong enough to support loads.

**Masses.** Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

**Mechanical treatment.** Use of mechanical equipment for seeding, brush management, and other management practices.

**Medium textured soil.** Very fine sandy loam, loam, silt loam, or silt.

**Mesa.** A broad, nearly flat topped and commonly isolated upland mass characterized by summit widths that are more than the heights of bounding erosional scarps.

**Metamorphic rock.** Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

**Microhigh.** An area that is 2 to 12 inches higher than the adjacent microlow.

**Microlow.** An area that is 2 to 12 inches lower than the adjacent microhigh.

**Mineral soil.** Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

**Minimum tillage.** Only the tillage essential to crop production and prevention of soil damage.

**Miscellaneous area.** An area that has little or no natural soil and supports little or no vegetation.

**Moderately coarse textured soil.** Coarse sandy loam, sandy loam, or fine sandy loam.

**Moderately deep soil.** A soil that is 20 to 40 inches deep over bedrock or to other material that restricts the penetration of plant roots.

**Moderately fine textured soil.** Clay loam, sandy clay loam, or silty clay loam.

**Mollic epipedon.** A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

**Morphology, soil.** The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

**Mottling, soil.** Irregular spots of different colors that vary in number and size.

Descriptive terms are as follows: abundance—*few*, *common*, and *many*; size—*fine*, *medium*, and *coarse*; and contrast—*faint*, *distinct*, and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

**Mudstone.** Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

**Munsell notation.** A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

**Natric horizon.** A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

**Neutral soil.** A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

**Nodules.** Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

**Nutrient, plant.** Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

**Organic matter.** Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low .....	less than 0.5 percent
Low .....	0.5 to 1.0 percent
Moderately low .....	1.0 to 2.0 percent
Moderate .....	2.0 to 4.0 percent
High .....	4.0 to 8.0 percent
Very high .....	more than 8.0 percent

**Oxbow.** The horseshoe-shaped channel of a former meander, remaining after the stream formed a cutoff across a narrow meander neck.

**Pan.** A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, hardpan, fragipan, claypan, plowpan, and traffic pan.

**Parent material.** The unconsolidated organic and mineral material in which soil forms.

**Pebble.** See Gravel.

**Ped.** An individual natural soil aggregate, such as a granule, a prism, or a block.

**Pedisediment.** A thin layer of alluvial material that mantles an erosion surface and has been transported to its present position from higher lying areas of the erosion surface.

**Pedon.** The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

**Percolation.** The downward movement of water through the soil.



**Permeability.** The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as “saturated hydraulic conductivity,” which is defined in the “Soil Survey Manual.” In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as “permeability.” Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow .....	0.00 to 0.01 inches
Very slow .....	0.01 to 0.06 inches
Slow .....	0.06 to 0.2 inches
Moderately slow .....	0.2 to 0.6 inches
Moderate .....	0.6 to 2.0 inches
Moderately rapid .....	2.0 to 6.0 inches
Rapid .....	6.0 to 20 inches
Very rapid .....	more than 20 inches

**Phase, soil.** A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

**pH value.** A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

**Piping** (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

**Plasticity index.** The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

**Plastic limit.** The moisture content at which a soil changes from semisolid to plastic.

**Plateau.** An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

**Playa.** The generally dry and nearly level lake plain that occupies the lowest parts of closed depressional areas. Temporary flooding occurs primarily in response to precipitation and runoff.

**Plowpan.** A compacted layer formed in the soil directly below the plowed layer.

**Ponding.** Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

**Poor filter** (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

**Poorly graded.** Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

**Potential native plant community.** See Climax plant community.

**Potential rooting depth (effective rooting depth).** Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

**Prescribed burning.** Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

**Productivity, soil.** The capability of a soil for producing a specified plant or sequence of plants under specific management.

**Profile, soil.** A vertical section of the soil extending through all its horizons and into the parent material.

**Proper grazing use.** Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable

vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

**Range condition.** The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

**Rangeland.** Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

**Range site.** An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

**Reaction, soil.** A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid .....	less than 3.5
Extremely acid .....	3.5 to 4.4
Very strongly acid .....	4.5 to 5.0
Strongly acid .....	5.1 to 5.5
Moderately acid .....	5.6 to 6.0
Slightly acid .....	6.1 to 6.5
Neutral .....	6.6 to 7.3
Slightly alkaline .....	7.4 to 7.8
Moderately alkaline .....	7.9 to 8.4
Strongly alkaline .....	8.5 to 9.0
Very strongly alkaline .....	9.1 and higher

**Red beds.** Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

**Redoximorphic concentrations.** Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

**Redoximorphic depletions.** Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

**Redoximorphic features.** Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

**Reduced matrix.** A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

**Regolith.** The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

**Relict stream terrace.** One of a series of platforms in or adjacent to a stream valley that formed prior to the current stream system.

**Relief.** The elevations or inequalities of a land surface, considered collectively.

**Residuum (residual soil material).** Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

**Ridge.** A long, narrow elevation of the land surface. It generally is sharp crested and forms an extended upland between valleys.

**Rill.** A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

**Riser.** The relatively short, steeply sloping area below a terrace tread that grades to a lower terrace tread or base level.

**Riverwash.** Unstable areas of sandy, silty, clayey, or gravelly sediments. These areas are flooded, washed, and reworked by rivers so frequently that they support little or no vegetation.

**Road cut.** A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

**Rock fragments.** Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

**Rock outcrop.** Exposures of bare bedrock other than lava flows and rock-lined pits.

**Root zone.** The part of the soil that can be penetrated by plant roots.

**Rubble land.** Areas that have more than 90 percent of the surface covered by stones or boulders. Voids contain no soil material and virtually no vegetation other than lichens. The areas commonly are at the base of mountain slopes, but some are on mountain slopes as deposits of cobbles, stones, and boulders left by Pleistocene glaciation or by periglacial phenomena.

**Runoff.** The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

**Saline soil.** A soil containing soluble salts in an amount that impairs the growth of plants. A saline soil does not contain excess exchangeable sodium.

**Salinity.** The electrical conductivity of a saline soil. It is expressed, in millimhos per centimeter, as follows:

Nonsaline .....	0 to 2
Very slightly saline .....	2 to 4
Slightly saline .....	4 to 8
Moderately saline .....	8 to 16
Strongly saline .....	more than 16

**Sand.** As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

**Sandstone.** Sedimentary rock containing dominantly sand-sized particles.

**Sandy soil.** Sand or loamy sand.

**Sapric soil material (muck).** The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

**Saturation.** Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water flows from the soil matrix into an unlined auger hole.

**Scarification.** The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

**Second bottom.** The first terrace above the normal flood plain (or first bottom) of a river.

**Sediment.** Solid, clastic material, both mineral and organic, that is in suspension, is being transported or has been moved from its site of origin by water, wind, ice, or mass wasting, and has come to rest on the earth's surface either above or below sea level.

**Sedimentary plain.** An extensive nearly level to gently rolling or moderately sloping area that is underlain by sedimentary bedrock and that has a slope of 0 to 8 percent.

**Sedimentary rock.** Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

**Sedimentary uplands.** Land areas of bedrock formed from water- or wind-deposited sediments. They are higher on the landscape than the flood plain.

**Seepage (in tables).** The movement of water through the soil. Seepage adversely affects the specified use.

**Semiconsolidated sedimentary beds.** Soft geologic sediments that disperse when fragments are placed in water. The fragments are hard or very hard when dry. Determining the texture by the usual field method is difficult.

**Sequum.** A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

**Series, soil.** A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

**Shale.** Sedimentary rock formed by the hardening of a clay deposit.

**Shallow soil.** A soil that is 10 to 20 inches deep over bedrock or to other material that restricts the penetration of plant roots.

**Sheet erosion.** The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

**Shoulder slope.** The uppermost inclined surface at the top of a hillside. It is the transition zone from the backslope to the summit of a hill or mountain. The surface is dominantly convex in profile and erosional in origin.

**Shrink-swell (in tables).** The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

**Silica.** A combination of silicon and oxygen. The mineral form is called quartz.

**Silt.** As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

**Siltstone.** Sedimentary rock made up of dominantly silt-sized particles.

**Similar soils.** Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

**Sinkhole.** A depression in the landscape where limestone has been dissolved.

**Slickensides.** Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

**Slick spot.** A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.

**Slope.** The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus,

a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey the following slope classes are recognized:

Nearly level .....	0 to 1 percent
Very gently sloping .....	1 to 3 percent
Gently sloping .....	3 to 5 percent
Moderately sloping .....	5 to 8 percent
Strongly sloping .....	8 to 12 percent
Moderately steep .....	12 to 20 percent
Steep .....	20 to 45 percent
Very steep .....	45 percent and higher

Classes for complex slopes are as follows:

Nearly level .....	0 to 3 percent
Gently undulating .....	1 to 5 percent
Undulating .....	1 to 8 percent
Gently rolling .....	5 to 12 percent
Rolling .....	5 to 15 percent
Hilly .....	8 to 30 percent
Steep .....	20 to 45 percent
Very steep .....	45 percent and higher

**Slope** (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

**Slow refill** (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

**Sodic (alkali) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Sodicity.** The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of  $\text{Na}^+$  to  $\text{Ca}^{++}$  plus  $\text{Mg}^{++}$ . The degrees of sodicity and their respective ratios are:

Slight .....	less than 13:1
Moderate .....	13 to 30:1
Strong .....	more than 30:1

**Soft bedrock.** Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

**Soil.** A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

**Soil separates.** Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand .....	2.0 to 1.0
Coarse sand .....	1.0 to 0.5
Medium sand .....	0.5 to 0.25
Fine sand .....	0.25 to 0.10
Very fine sand .....	0.10 to 0.05
Silt .....	0.05 to 0.002
Clay .....	less than 0.002

**Solum.** The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons.

Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

**Species.** A single, distinct kind of plant or animal having certain distinguishing characteristics.

**Stone line.** A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

**Stones.** Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

**Stony.** Refers to a soil containing stones in numbers that interfere with or prevent tillage.

**Stratified.** Arranged in strata, or layers. The term refers to geologic material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

**Strath terrace.** A surface cut formed by the erosion of hard or semiconsolidated bedrock and thinly mantled with stream deposits.

**Stream channel.** The hollow bed where a natural stream of surface water flows or may flow; the deepest or central part of the bed, formed by the main current and covered more or less continuously by water.

**Stream piracy.** The natural diversion of one stream into the channel of another, commonly by a process of erosion.

**Stream terrace.** One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel. It originally formed near the level of the stream and is the dissected remnants of an abandoned flood plain, streambed, or valley floor that were produced during a former stage of erosion or deposition.

**Stripcropping.** Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to soil blowing and water erosion.

**Structure, soil.** The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are: *platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. Structureless soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

**Stubble mulch.** Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

**Subsoil.** Technically, the B horizon; roughly, the part of the solum below plow depth.

**Subsoiling.** Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

**Substratum.** The part of the soil below the solum.

**Subsurface layer.** Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

**Summer fallow.** The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.



**Summit.** A general term for the top, or highest level, of an upland feature, such as a hill or mountain. It commonly refers to a higher area that has a gentle slope and is flanked by steeper slopes.

**Surface layer.** The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

**Surface soil.** The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

**Tailwater.** The water directly downstream of a structure.

**Terrace.** An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

**Terrace (geologic).** An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

**Texture, soil.** The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

**Thin layer** (in tables). Otherwise suitable soil material too thin for the specified use.

**Tilth, soil.** The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

**Toeslope.** The outermost inclined surface at the base of a hill; part of a foot slope.

**Topsoil.** The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

**Trace elements.** Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

**Trafficability.** The degree to which a soil is capable of supporting vehicular traffic across a wide range in soil moisture conditions.

**Tread.** The relatively flat terrace surface that was cut or built by stream or wave action.

**Underfit.** Greatly reduced in volume and therefore in ability to erode or transport as a consequence of stream piracy.

**Upland** (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

**Valley.** An elongated depressional area primarily developed by stream action.

**Valley fill.** Alluvium deposited by heavily loaded streams.

**Variation.** Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

**Very deep soil.** A soil that is more than 60 inches deep over bedrock or to other material that restricts the penetration of plant roots.

**Very shallow soil.** A soil that is less than 10 inches deep over bedrock or to other material that restricts the penetration of plant roots.

**Well graded.** Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

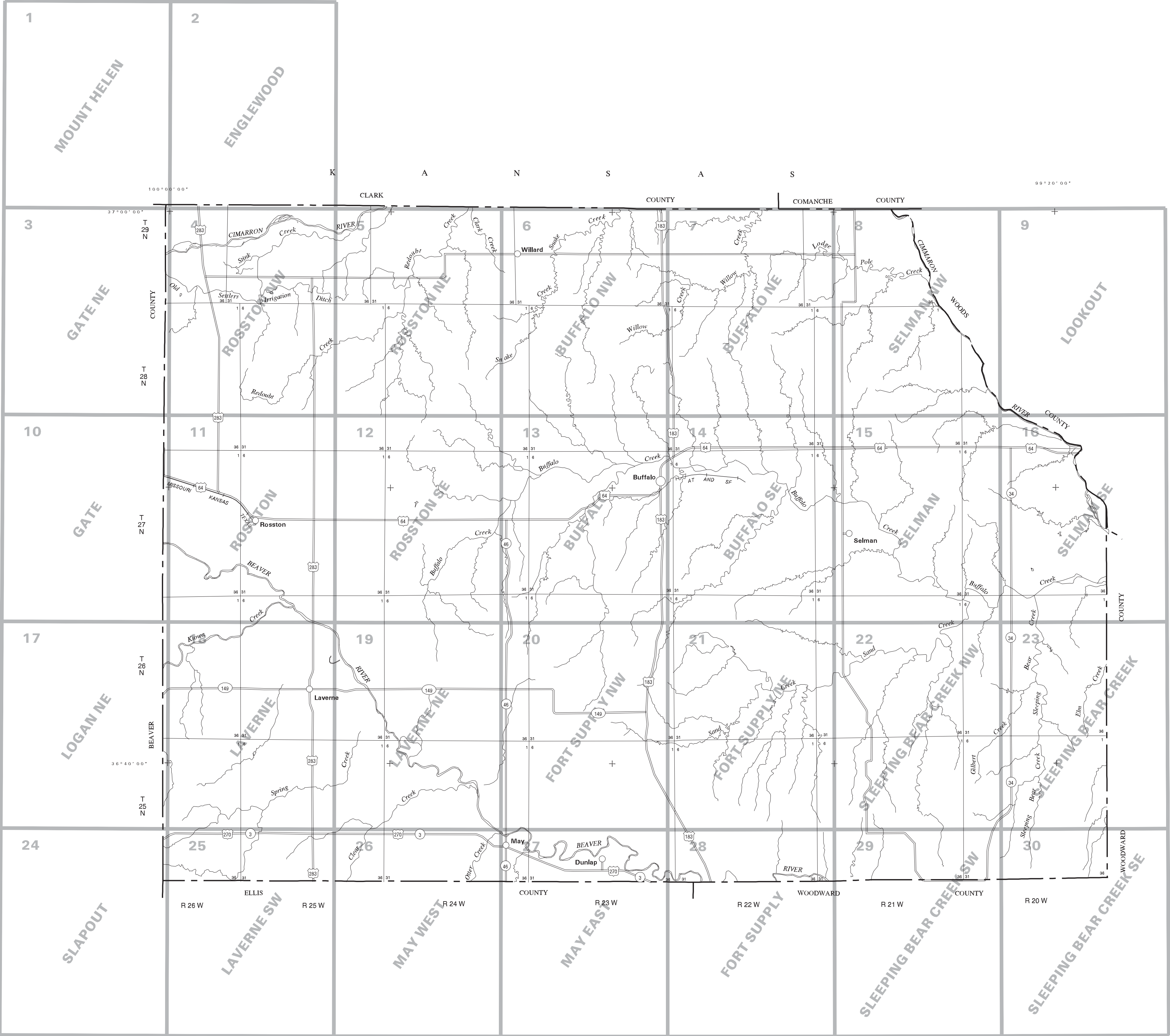
**Wilting point (or permanent wilting point).** The moisture content of soil, on an oven-dry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

# NRCS Accessibility Statement

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SECTIONALIZED  
TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36



INDEX TO MAP SHEETS  
HARPER COUNTY, OKLAHOMA

1 0 1 2 3  
MILES

1 0 1 2 3 4 5 6  
KILOMETERS

SCALE = 1:165000

SOIL LEGEND

Soil map symbols are in alphabetical order. The first letter, always a capital, is generally the initial letter of the map unit name. The second and third letters are lowercase, except in the case of undifferentiated groups, complexes, or miscellaneous areas in which they may be capital letters. These letters generally come from the soil name. The fourth letter is a capital and indicates slope. The last part of some symbols is a number that represents an eroded or gullied phase of a map unit.

SYMBOL	NAME
AbbA	Abbie loam, 0 to 1 percent slopes
AbbB	Abbie loam, 1 to 3 percent slopes
AbbB2	Abbie loam, 1 to 3 percent slopes, eroded
AbbC	Abbie loam, 3 to 5 percent slopes
AbbC2	Abbie loam, 3 to 5 percent slopes, eroded
AbsB	Abilene silt loam, 1 to 3 percent slopes
AcIA	Abbie clay loam, 0 to 1 percent slopes
AfIB	Abbie fine sandy loam, 1 to 3 percent slopes
AfIC	Abbie fine sandy loam, 3 to 5 percent slopes
BdaB	Berda loam, 1 to 3 percent slopes
BdaC	Berda loam, 3 to 5 percent slopes
BdaD	Berda loam, 5 to 8 percent slopes
CRVE	Cottonwood-Rock outcrop-Vinson complex, 3 to 12 percent slopes
DAM	Large dam
DevE	Devol loamy fine sand, 8 to 12 percent slopes
DpwB	Deepwood loam, 1 to 3 percent slopes
DpwC	Deepwood loam, 3 to 5 percent slopes
DpwD	Deepwood loam, 5 to 8 percent slopes
DpwE	Deepwood loam, 8 to 12 percent slopes
DvIB	Devol fine sandy loam, 1 to 3 percent slopes
DvIC	Devol fine sandy loam, 3 to 5 percent slopes
DvID	Devol fine sandy loam, 5 to 8 percent slopes
EdIC	Eda loamy sand, 1 to 5 percent slopes
EdIE	Eda loamy sand, 5 to 12 percent slopes
FayB	Farry fine sandy loam, 1 to 3 percent slopes
FayC	Farry fine sandy loam, 3 to 5 percent slopes
FoFE	Fortyone-Farry complex, 5 to 12 percent slopes
FrkA	Frankirk silt loam, 0 to 1 percent slopes
FrkB	Frankirk silt loam, 1 to 3 percent slopes
FtnB	Fortyone sandy loam, 1 to 3 percent slopes
FtnC	Fortyone sandy loam, 3 to 5 percent slopes
FtnD	Fortyone sandy loam, 5 to 8 percent slopes
GcsA	Gracemore fine sandy loam, 0 to 1 percent slopes, rarely flooded
GdfB	Grandfield fine sandy loam, 1 to 3 percent slopes
GdfC	Grandfield fine sandy loam, 3 to 5 percent slopes
GDGE	Grandfield-Devol-Grandmore complex, 1 to 12 percent slopes
GdmB	Grandmore fine sandy loam, 1 to 3 percent slopes
GfsA	Gracemore fine sandy loam, saline, 0 to 1 percent slopes, occasionally flooded
GmrA	Gracemont fine sandy loam, 0 to 1 percent slopes, rarely flooded
GmsA	Gracemont fine sandy loam, saline, 0 to 1 percent slopes, rarely flooded
GrmA	Gracemore fine sandy loam, saline, 0 to 1 percent slopes, rarely flooded
HdGB	Hardeman-Grandmore complex, 1 to 3 percent slopes
HdGC	Hardeman-Grandmore complex, 3 to 5 percent slopes
HdmB	Hardeman fine sandy loam, 1 to 3 percent slopes
HdmC	Hardeman fine sandy loam, 3 to 5 percent slopes
IreA	Irene silt loam, 0 to 1 percent slopes
IreB	Irene silt loam, 1 to 3 percent slopes
IreC	Irene silt loam, 3 to 5 percent slopes
IreD	Irene silt loam, 5 to 8 percent slopes
JssF	Jester sand, 5 to 12 percent slopes
JstC	Jester loamy fine sand, 1 to 5 percent slopes
KidB	Kingsdown fine sandy loam, 1 to 3 percent slopes
KIHE	Kingsdown-Hardeman complex, 0 to 12 percent slopes
LgtA	Lugert silt loam, 0 to 1 percent slopes, occasionally flooded
LIJC	Lincoln-Jester complex, 0 to 5 percent slopes, rarely flooded
LikB	Likes fine sandy loam, 1 to 3 percent slopes
LisA	Lincoln sand, 0 to 1 percent slopes, frequently flooded
LncA	Lincoln clay loam, 0 to 1 percent slopes, rarely flooded
LRoE	Laverne-Rock outcrop complex, 1 to 12 percent slopes
LshA	Lesho clay loam, 0 to 1 percent slopes, rarely flooded
LsoA	Lincoln sand, 0 to 1 percent slopes, occasionally flooded

M-W	Miscellaneous water
MLBB	Mobeetie-Likes-Berda complex, 1 to 3 percent slopes
MLBC	Mobeetie-Likes-Berda complex, 3 to 5 percent slopes
MLBE	Mobeetie-Likes-Berda complex, 5 to 12 percent slopes
MnsB	Mansic clay loam, 1 to 3 percent slopes
MnsC	Mansic clay loam, 3 to 5 percent slopes
MsnB	Manson loam, 1 to 3 percent slopes
MsnC	Manson loam, 3 to 5 percent slopes
MsnC2	Manson loam, 3 to 5 percent slopes, eroded
OMBE	Oklark-Mansic-Berda complex, 5 to 12 percent slopes
OMBG	Oklark-Mansic-Berda complex, 12 to 45 percent slopes
PdoA	Paloduro clay loam, 0 to 1 percent slopes
PdoB	Paloduro clay loam, 1 to 3 percent slopes
PdoC2	Paloduro clay loam, 3 to 5 percent slopes, eroded
PIT	Pits
PlmB	Plemons loam, 1 to 3 percent slopes
PlmC	Plemons loam, 3 to 5 percent slopes
PlmD	Plemons loam, 5 to 8 percent slopes
QnWC3	Quinlan-Woodward complex, 3 to 5 percent slopes, severely eroded
QnWD	Quinlan-Woodward complex, 5 to 8 percent slopes
QnWE	Quinlan-Woodward complex, 5 to 12 percent slopes
QRWG	Quinlan-Rock outcrop-Woodward complex, 5 to 45 percent slopes
QRYG	Quinlan-Rock outcrop-Yomont complex, 0 to 45 percent slopes
QWDE	Quinlan-Woodward-Deepwood complex, 5 to 12 percent slopes
QWRC	Quinlan-Woodward-Rock outcrop complex, 1 to 5 percent slopes
RoCH	Rock outcrop-Cottonwood complex, 12 to 80 percent slopes
RssA	Rosston clay, ponded, 0 to 1 percent slopes
SAL	Salt flats, 0 to 1 percent slopes
SelA	Selman silt loam, 0 to 1 percent slopes
SelB	Selman silt loam, 1 to 3 percent slopes
SelC	Selman silt loam, 3 to 5 percent slopes
SelC2	Selman silt loam, 3 to 5 percent slopes, eroded
SelD	Selman silt loam, 5 to 8 percent slopes
SelD2	Selman silt loam, 5 to 8 percent slopes, eroded
SprA	Spur loam, 0 to 1 percent slopes, rarely flooded
SpsA	Spur loam, saline, 0 to 1 percent slopes, rarely flooded
StpA	St. Paul silt loam, 0 to 1 percent slopes
StpB	St. Paul silt loam, 1 to 3 percent slopes
StpC	St. Paul silt loam, 3 to 5 percent slopes
StpD	St. Paul silt loam, 5 to 8 percent slopes
TeWE	Teagard-Wellsford complex, 1 to 12 percent slopes
TexA	Texroy loam, 0 to 1 percent slopes
TexB	Texroy loam, 1 to 3 percent slopes
TexC	Texroy loam, 3 to 5 percent slopes
TipA	Tipton loam, 0 to 1 percent slopes
TipB	Tipton loam, 1 to 3 percent slopes
TipC	Tipton loam, 3 to 5 percent slopes
TipD	Tipton loam, 5 to 8 percent slopes
TRQC	Talpa-Rock outcrop-Quinlan complex, 1 to 5 percent slopes
TvIC	Tivoli fine sand, 1 to 5 percent slopes
TvIE	Tivoli fine sand, 5 to 12 percent slopes
TvIG	Tivoli fine sand, 12 to 45 percent slopes
VerB	Vernon clay loam, 1 to 3 percent slopes
VerC	Vernon clay loam, 3 to 5 percent slopes
VerD	Vernon clay loam, 5 to 8 percent slopes
VrrB	Vernon sandy loam, 1 to 3 percent slopes, overblown
VrrC	Vernon sandy loam, 3 to 5 percent slopes, overblown
W	Water
WodA	Woods clay loam, 0 to 1 percent slopes
WodB	Woods clay loam, 1 to 3 percent slopes
WodC	Woods clay loam, 3 to 5 percent slopes
WQHE	Westola-Quinlan-Hardeman complex, 0 to 12 percent slopes
WQnB	Woodward-Quinlan complex, 1 to 3 percent slopes
WQnC	Woodward-Quinlan complex, 3 to 5 percent slopes
WslA	Westola fine sandy loam, 0 to 1 percent slopes, occasionally flooded
WstA	Westola fine sandy loam, 0 to 1 percent slopes, rarely flooded
YmrA	Yomont loam, 0 to 1 percent slopes, rarely flooded
YmtA	Yomont loam, 0 to 1 percent slopes, occasionally flooded

CONVENTIONAL AND SPECIAL  
SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

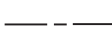
National, state, or province



County or parish



Reservation (national forest or park,  
state forest or park)



Land grant



Limit of soil survey (label)  
and/or denied access area

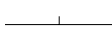


Field sheet matchline & neatline

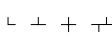


OTHER BOUNDARY (label)

STATE COORDINATE TICK  
1 890 000 FEET



LAND DIVISION CORNER  
(section and land grants)



GEOGRAPHIC COORDINATE TICK



TRANSPORTATION

Divided roads



Other roads

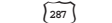


ROAD EMBLEM & DESIGNATIONS

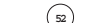
Interstate



Federal



State



RAILROAD



HYDROGRAPHIC FEATURES

STREAMS

Perennial, double line



Perennial, single line



Drainage end



SPECIAL SYMBOLS FOR SOIL  
SURVEY AND SSURGO

SOIL DELINEATIONS AND SYMBOLS



AD HOC FEATURES

Caliche pit







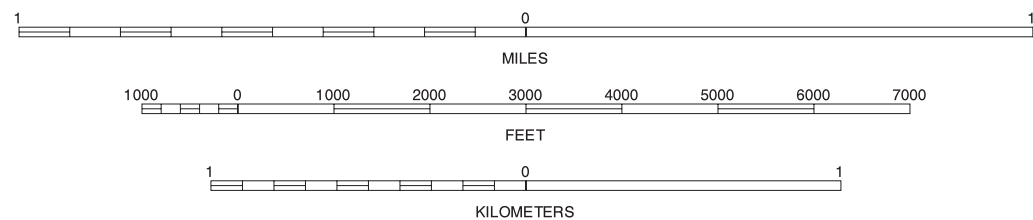
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1991 - 1998 aerial photography. PLSS was acquired from USGS and edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION



MOUNT HELEN, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 1 OF 30

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 2, Englewood

T. 29 N.

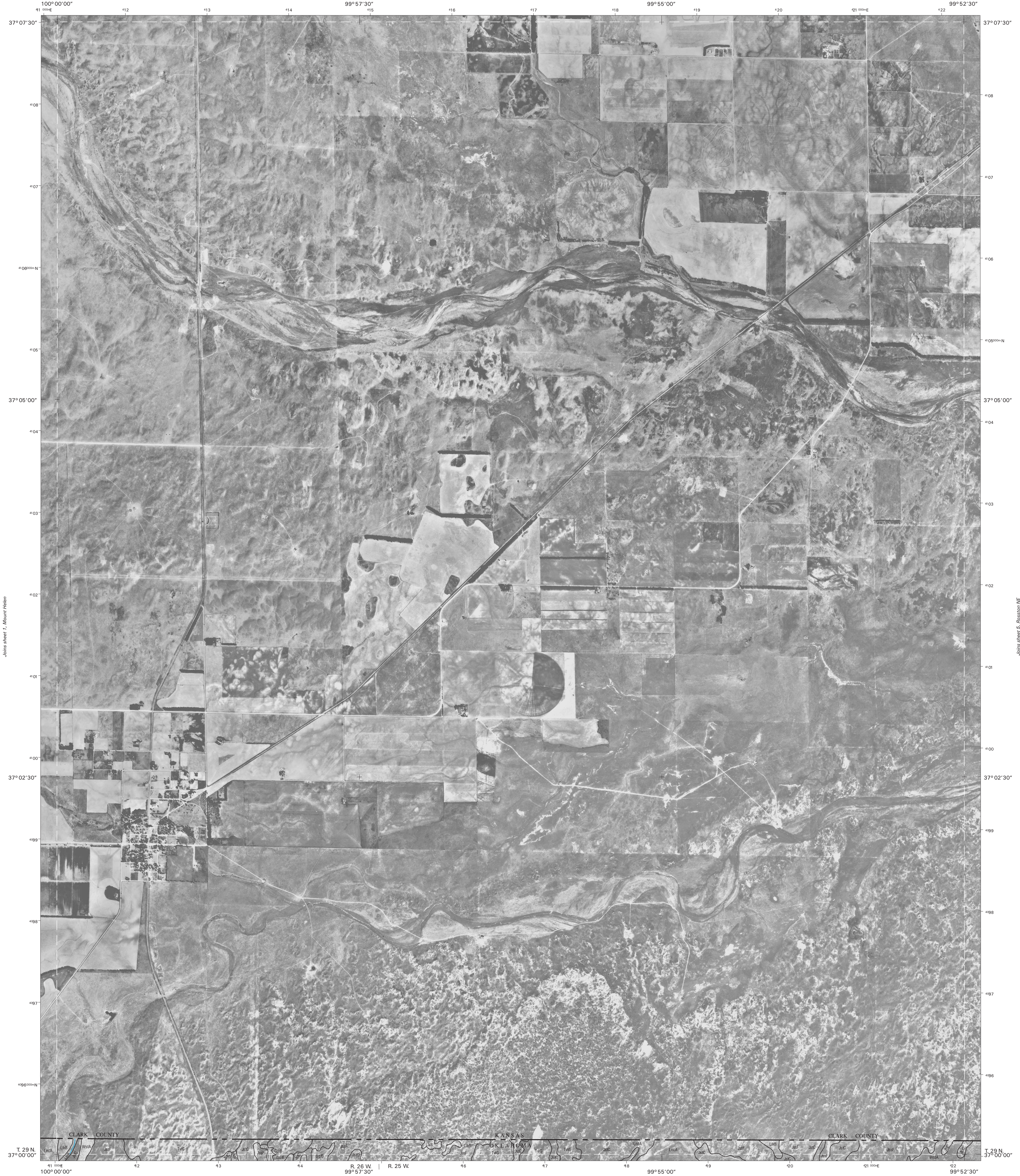
37° 00' 00"

R. 26 W.

100° 00' 00"

Joins sheet 6, Reactory NW





Joins sheet 1, Mount Helen  
Gale NE

Joins sheet 3, Rosston NE

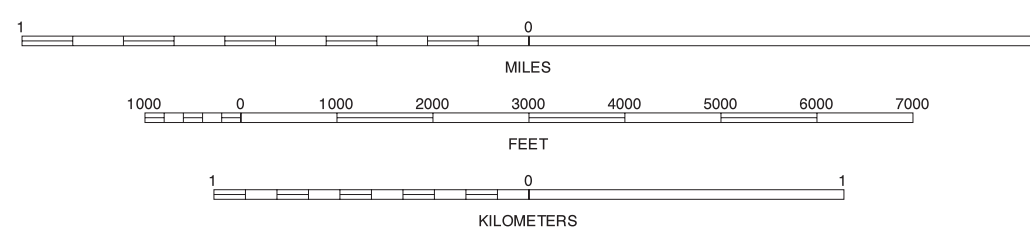
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1991 - 1998 aerial photography. PLSS was acquired from USGS and edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



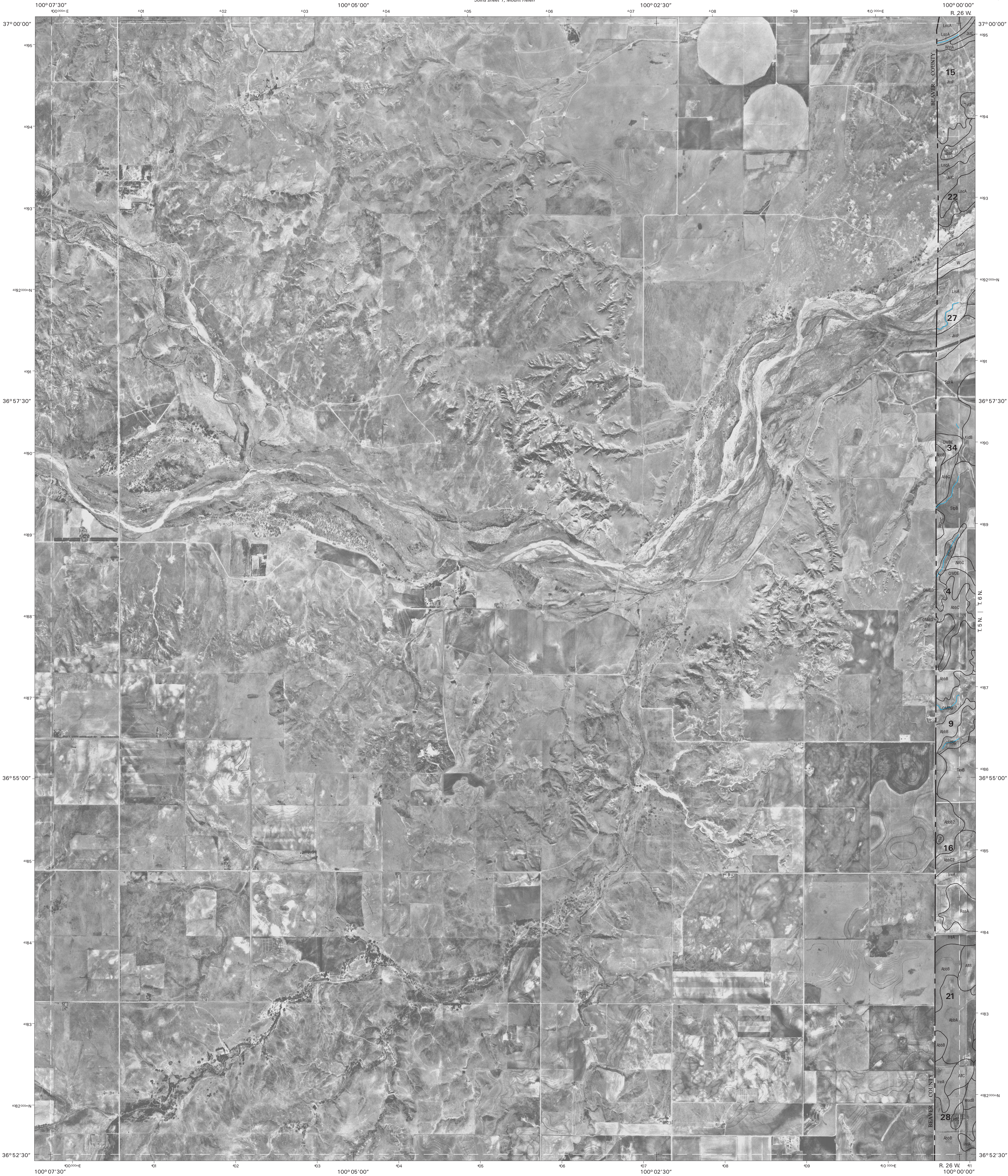
QUADRANGLE LOCATION



ENGLEWOOD, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 2 OF 30

Soil map delineations extending beyond the dashed white quadrangle neoline are for reference only and are included on adjacent map sheets.





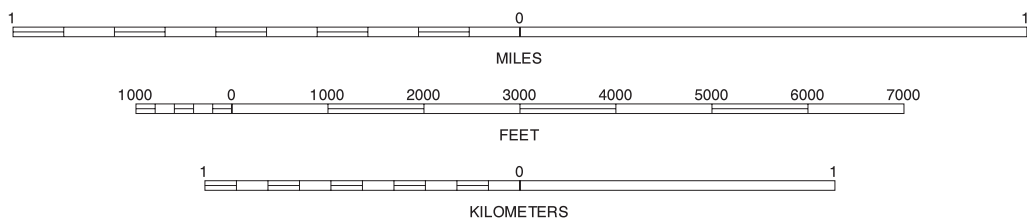
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1991 - 1996 aerial photography. PLSS was acquired from USGS and edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION



GATE NE, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 3 OF 30

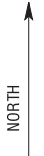
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



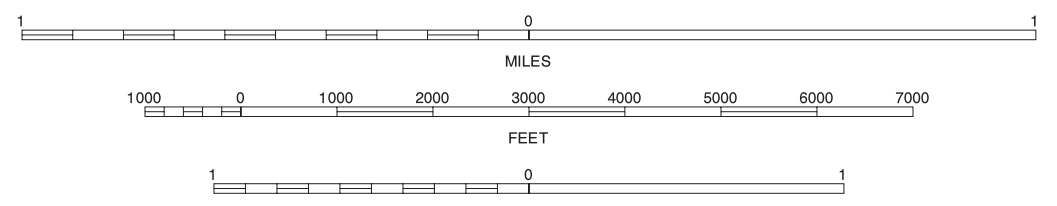


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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUADRANGLE LOCATION

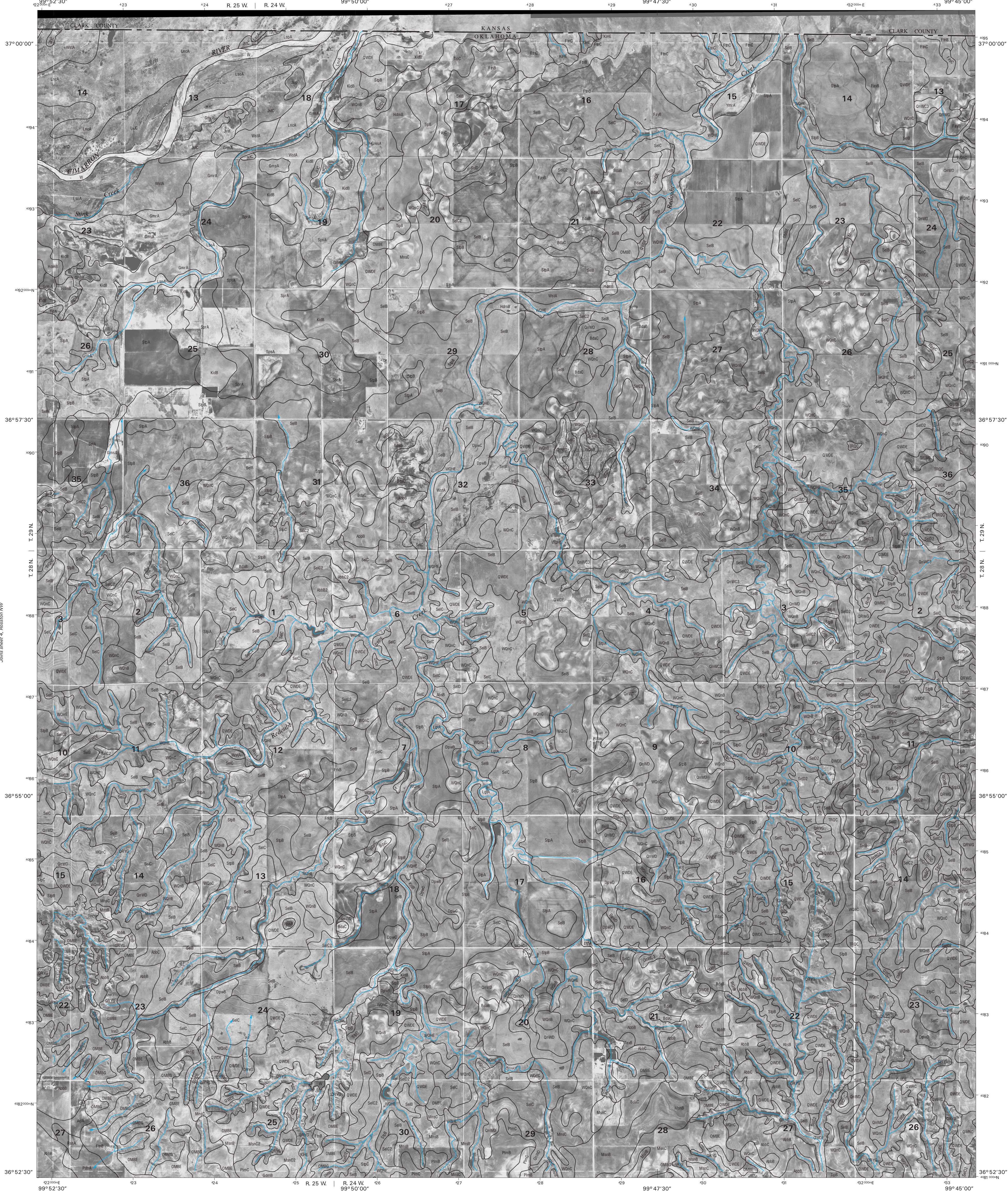


SCALE 1:24000

ROSSTON NW, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 4 OF 30

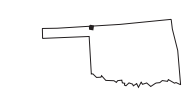
Soil map delineations extending beyond the dashed white quadrangle neartline are for reference only and are included on adjacent map sheets.



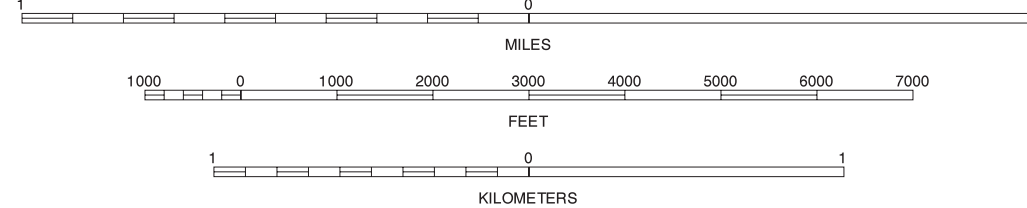


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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUADRANGLE LOCATION



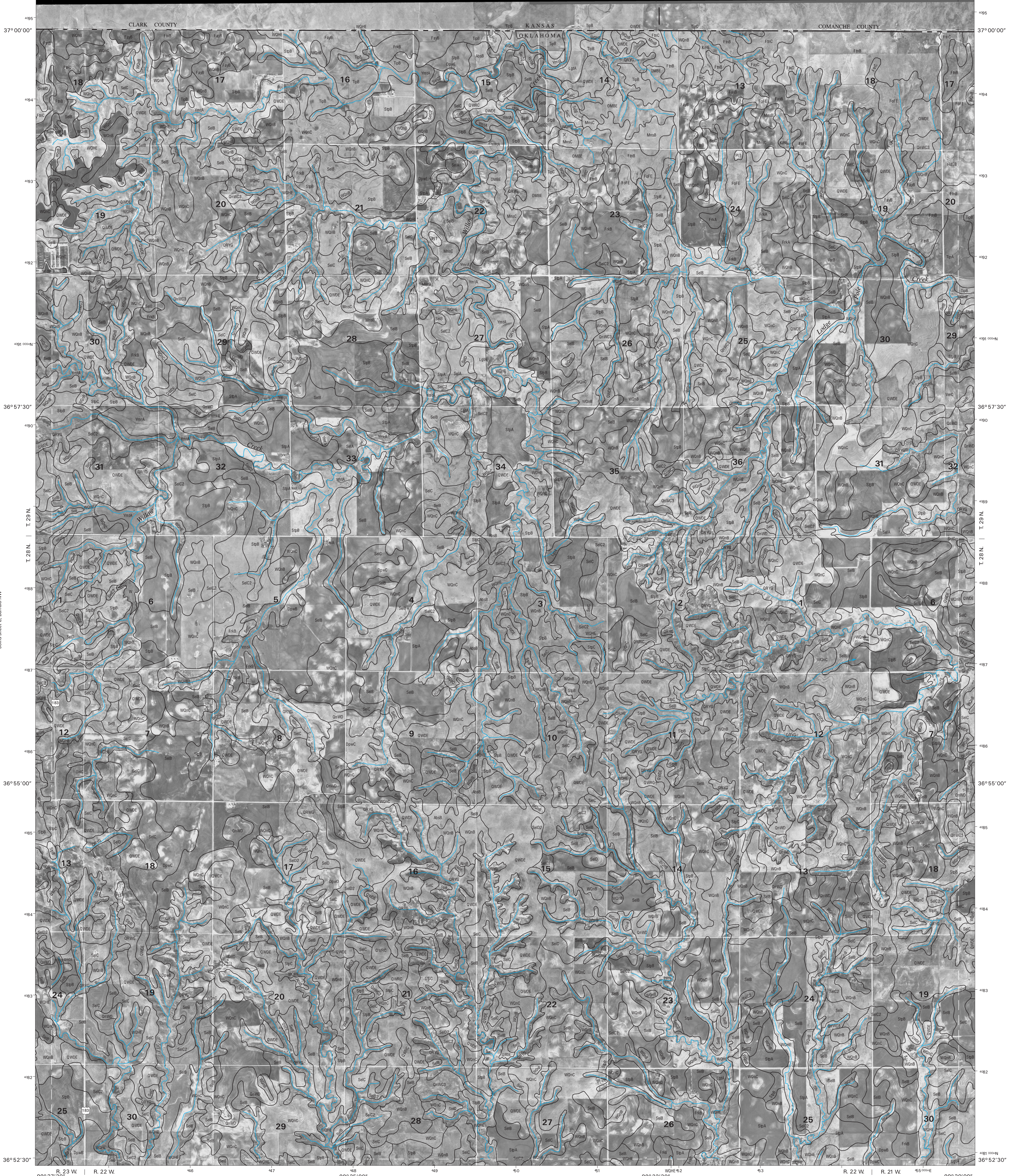
ROSSSTON NE, (OVERSIZED) OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 5 OF 30

Soil map delineations extending beyond the dashed white quadrangle realine are for reference only and are included on adjacent map sheets.



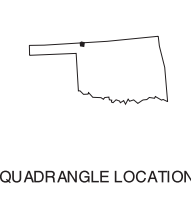




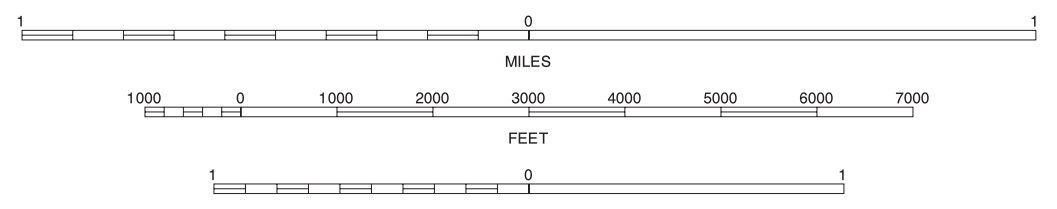


This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1991 - 1996 aerial photography. PLSS was acquired from USGS and edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUADRANGLE LOCATION

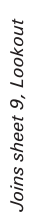


SCALE 1:24000

BUFFALO NE, (OVERSIZED) OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 7 OF 30

Soil map delineations extending beyond the dashed white quadrangle realine are for reference only and are included on adjacent map sheets.





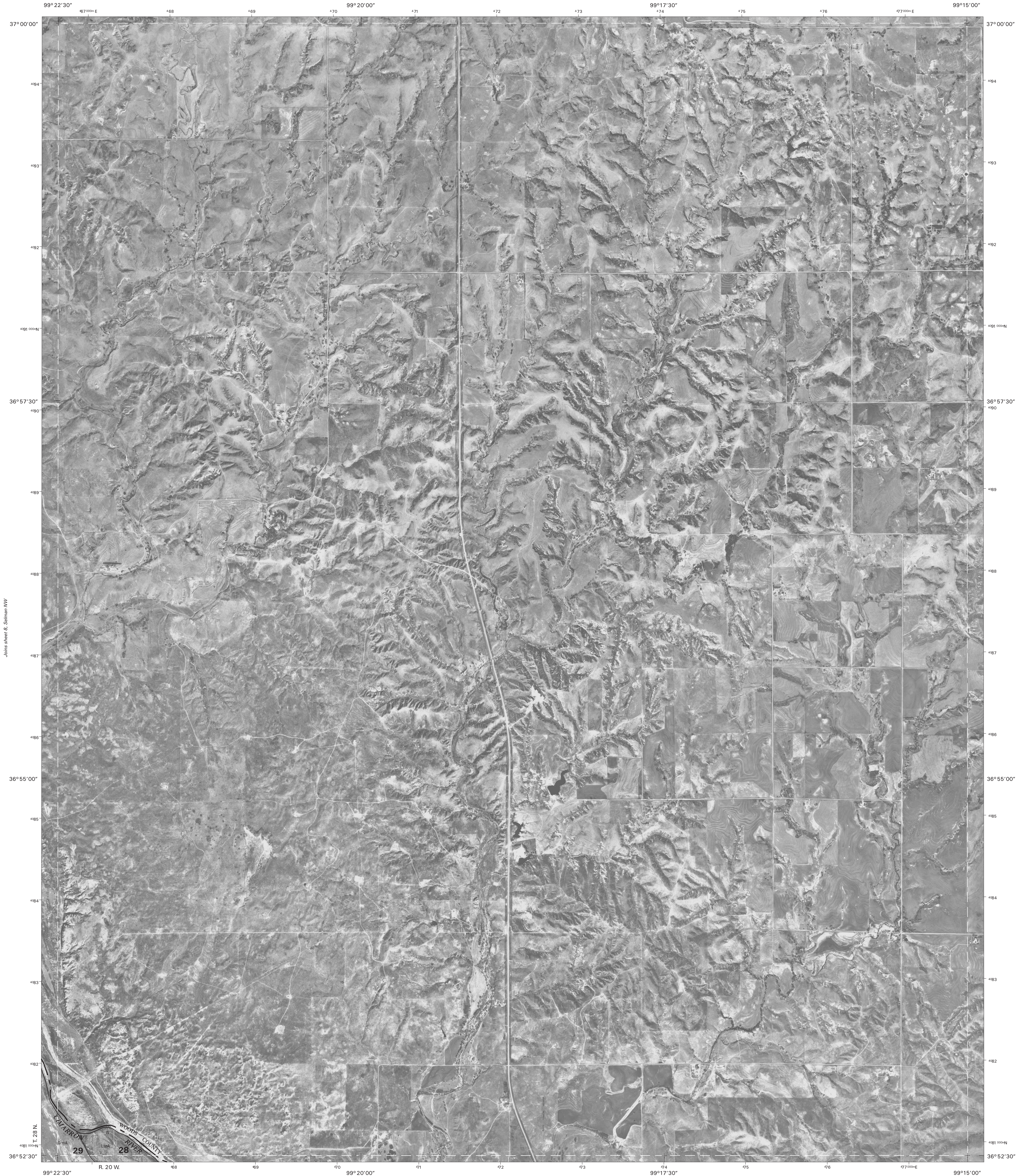
North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

SCALE 1:24000

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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.





Joins sheet 15,  
Selman

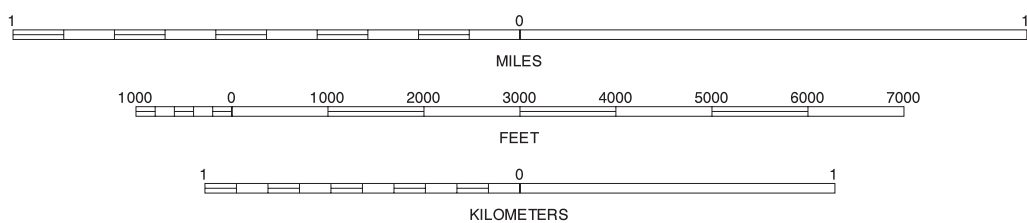
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1991 - 1996 aerial photography. PLSS was acquired from USGS and edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS-80 Spheroid  
1000-meter ticks: Universal Transverse Mercator, zone 14.  
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION



Joins sheet 16, Selman SE

SCALE 1:24000

LOOKOUT, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 9 OF 30

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.





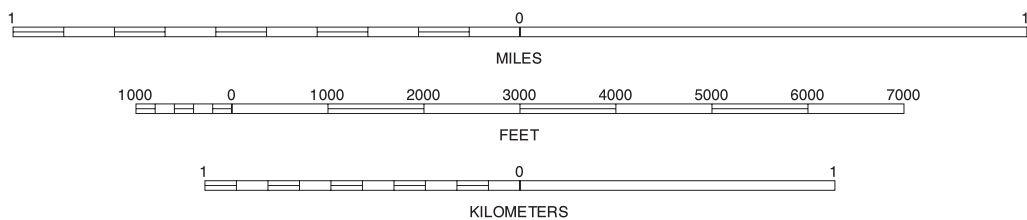
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1981-1988 aerial photography. PLSS was acquired from USGS and edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



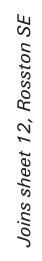
QUADRANGLE LOCATION



GATE, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 10 OF 30

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.



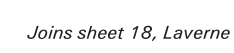


Joins sheet 17,  
Logan NE

NORTH



QUADRANGLE LOCATION

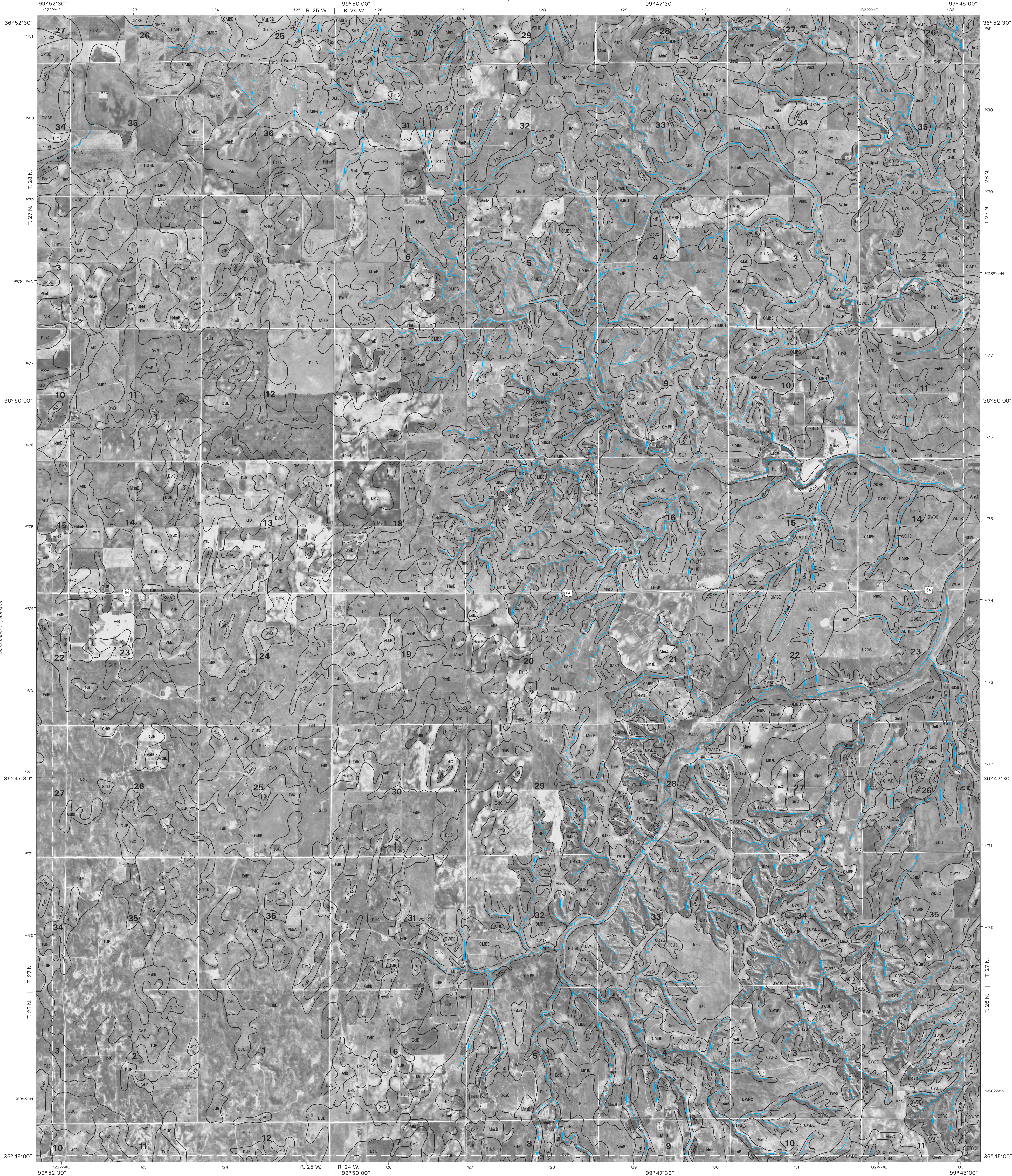


SCALE 1:24000

Joins sheet 19,  
Laverne NE

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



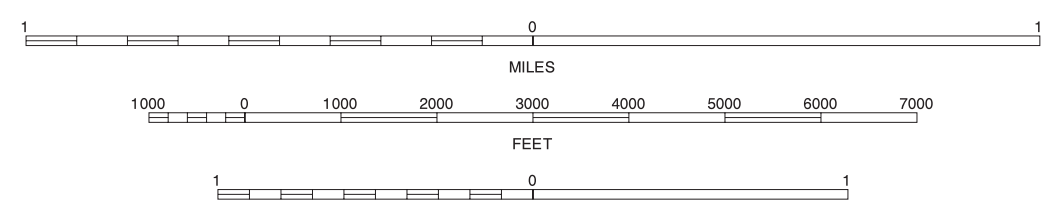


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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



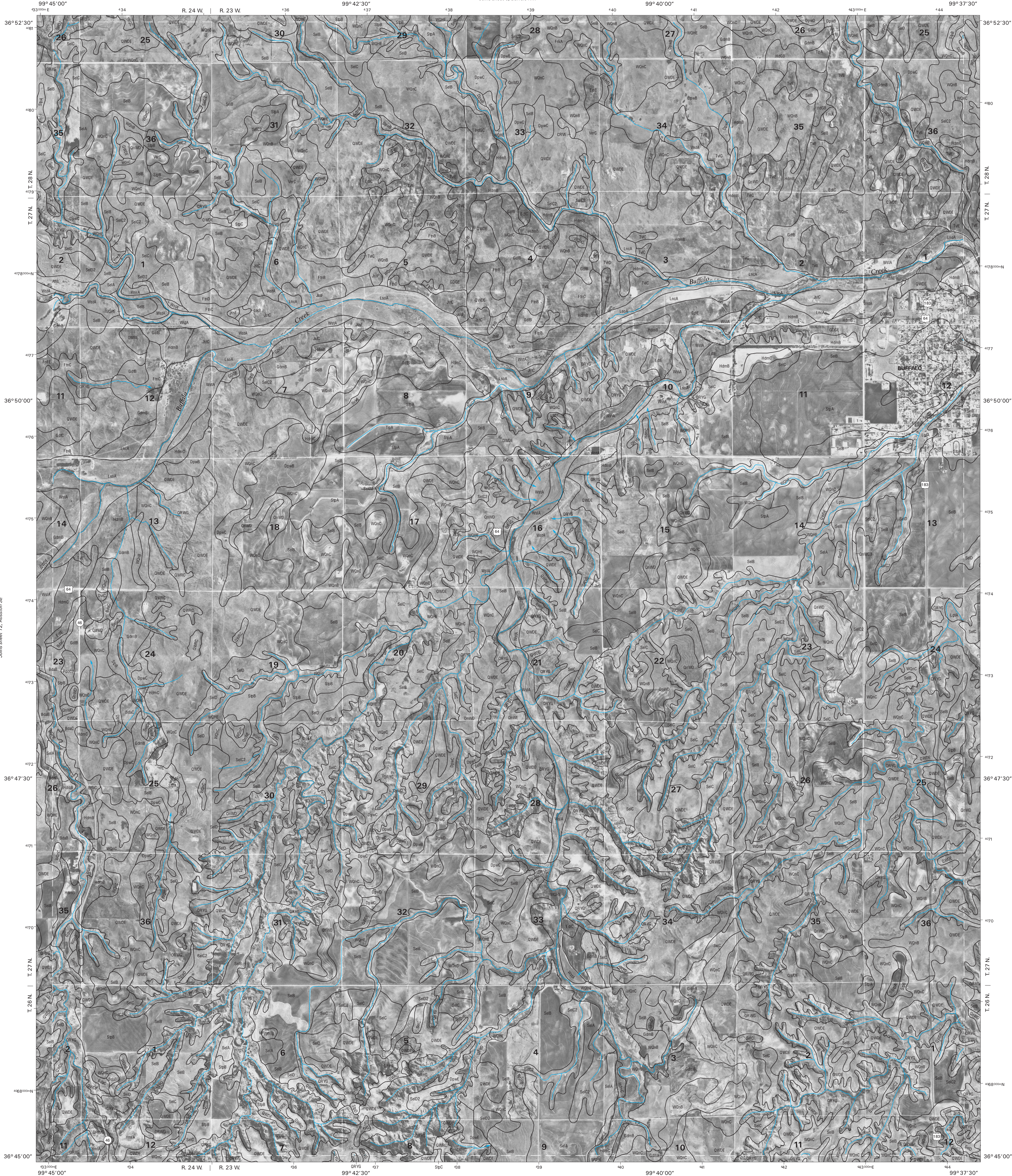
QUADRANGLE LOCATION



ROSSTON SE, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 12 OF 30

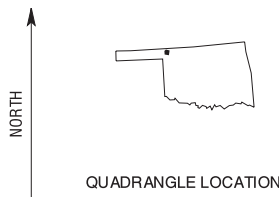
Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.



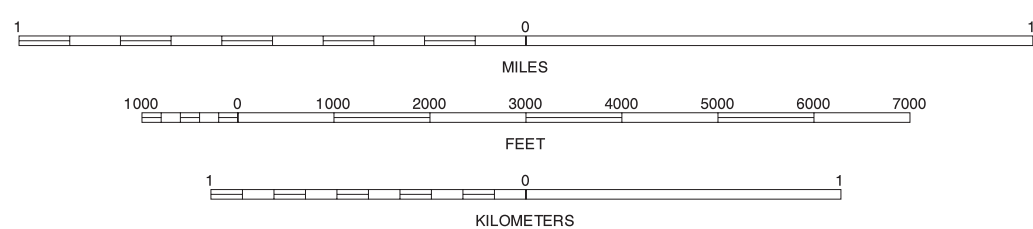


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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUADRANGLE LOCATION

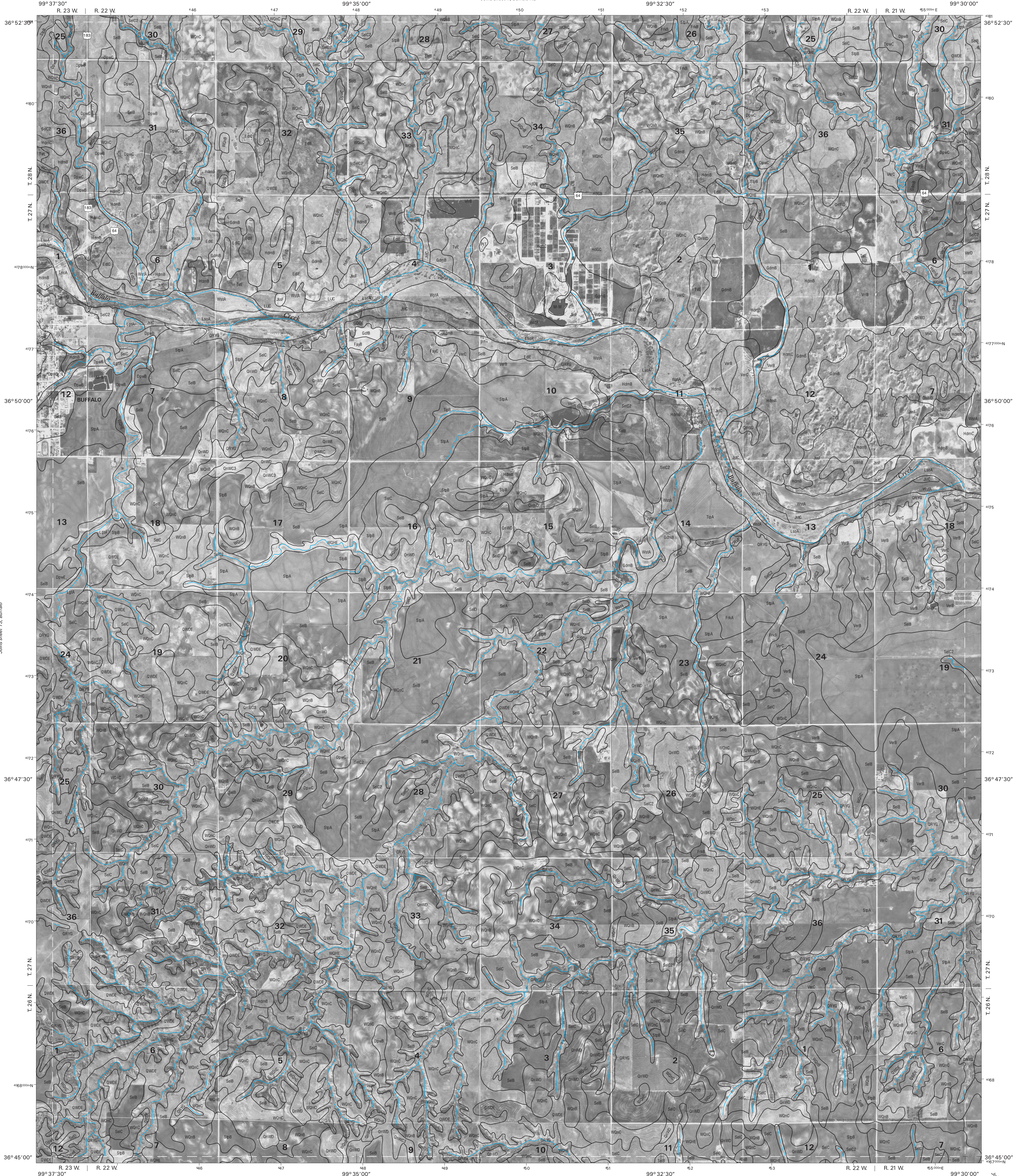


SCALE 1:24000

BUFFALO, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 13 OF 30

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.





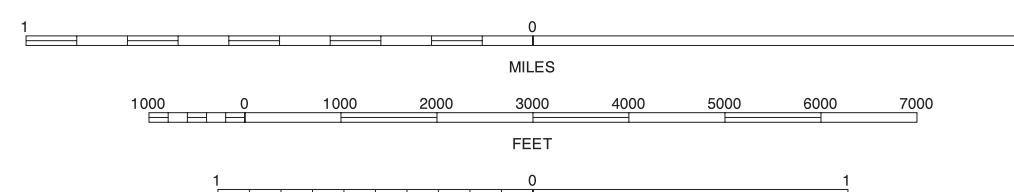
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1981-1988 aerial photography. PLSS was acquired from USGS and edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



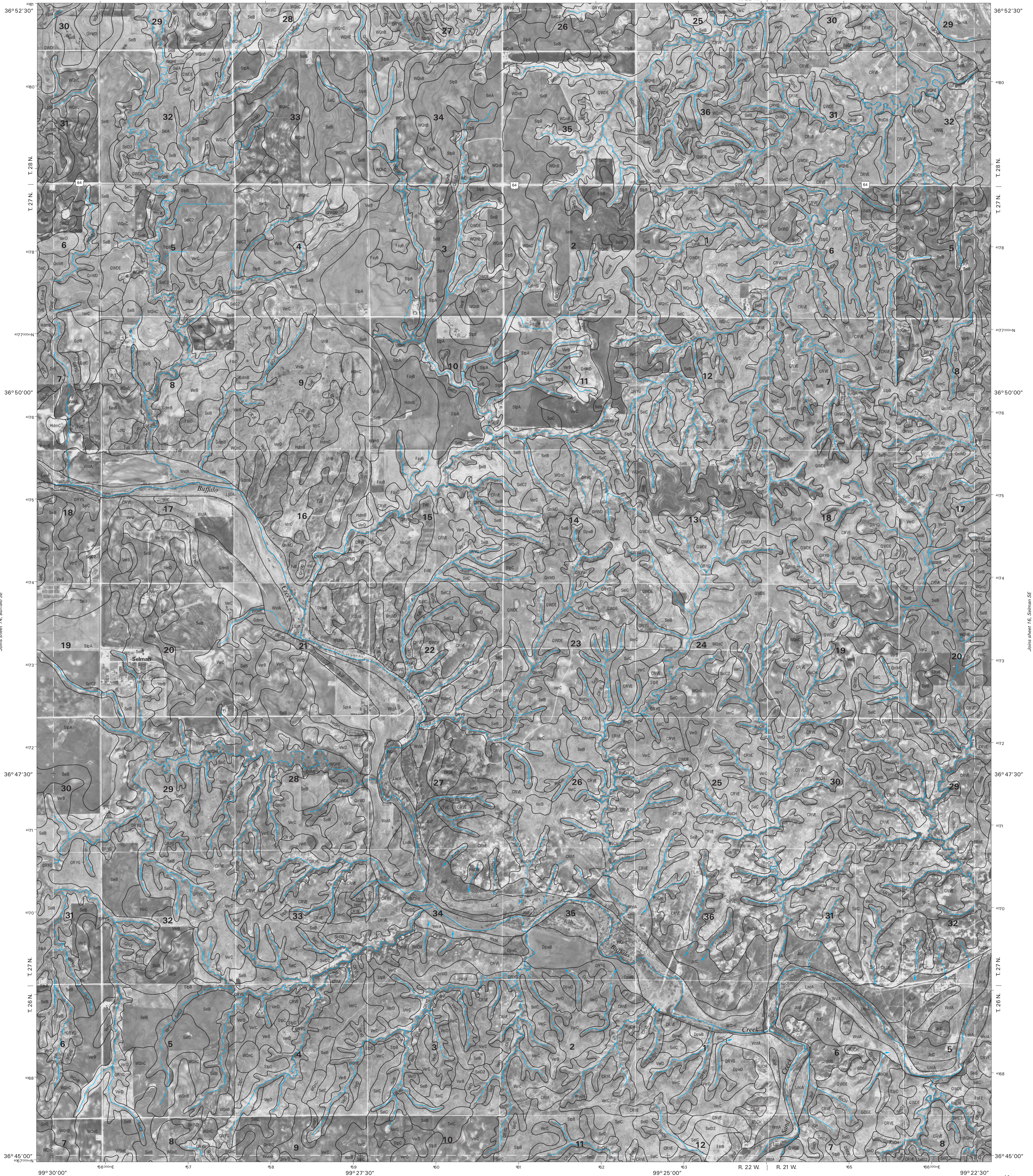
QUADRANGLE LOCATION



BUFFALO SE, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 14 OF 30

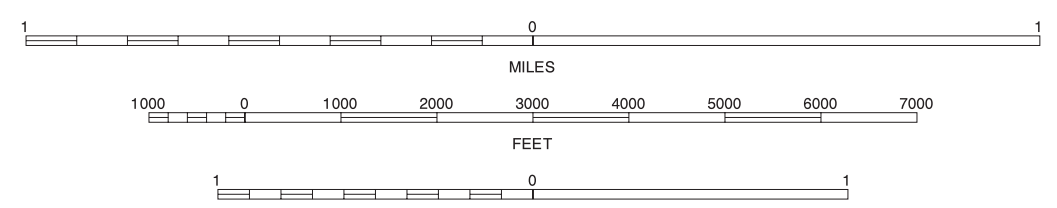
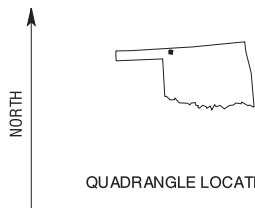
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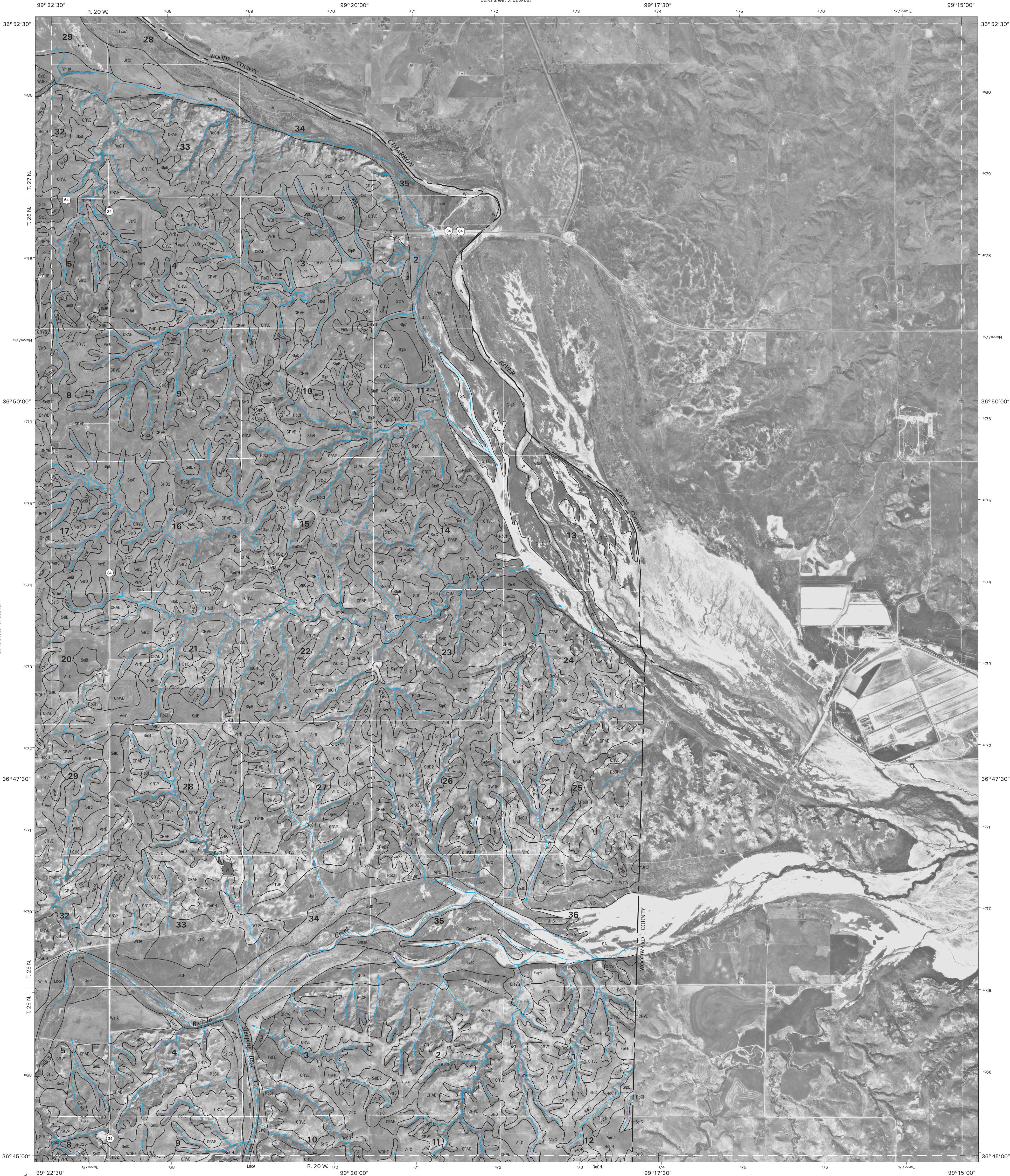
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SELMAN, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 15 OF 30

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.





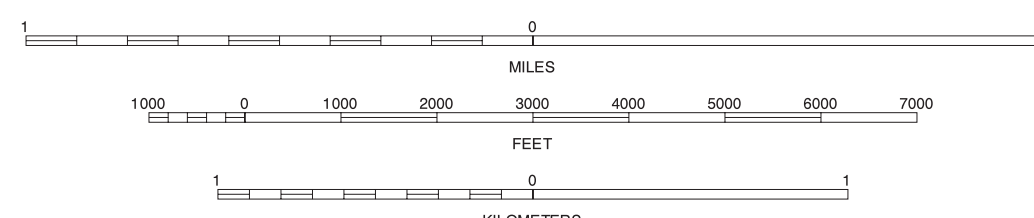
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1981-1986 aerial photography. PLUS was acquired from USGS and edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION



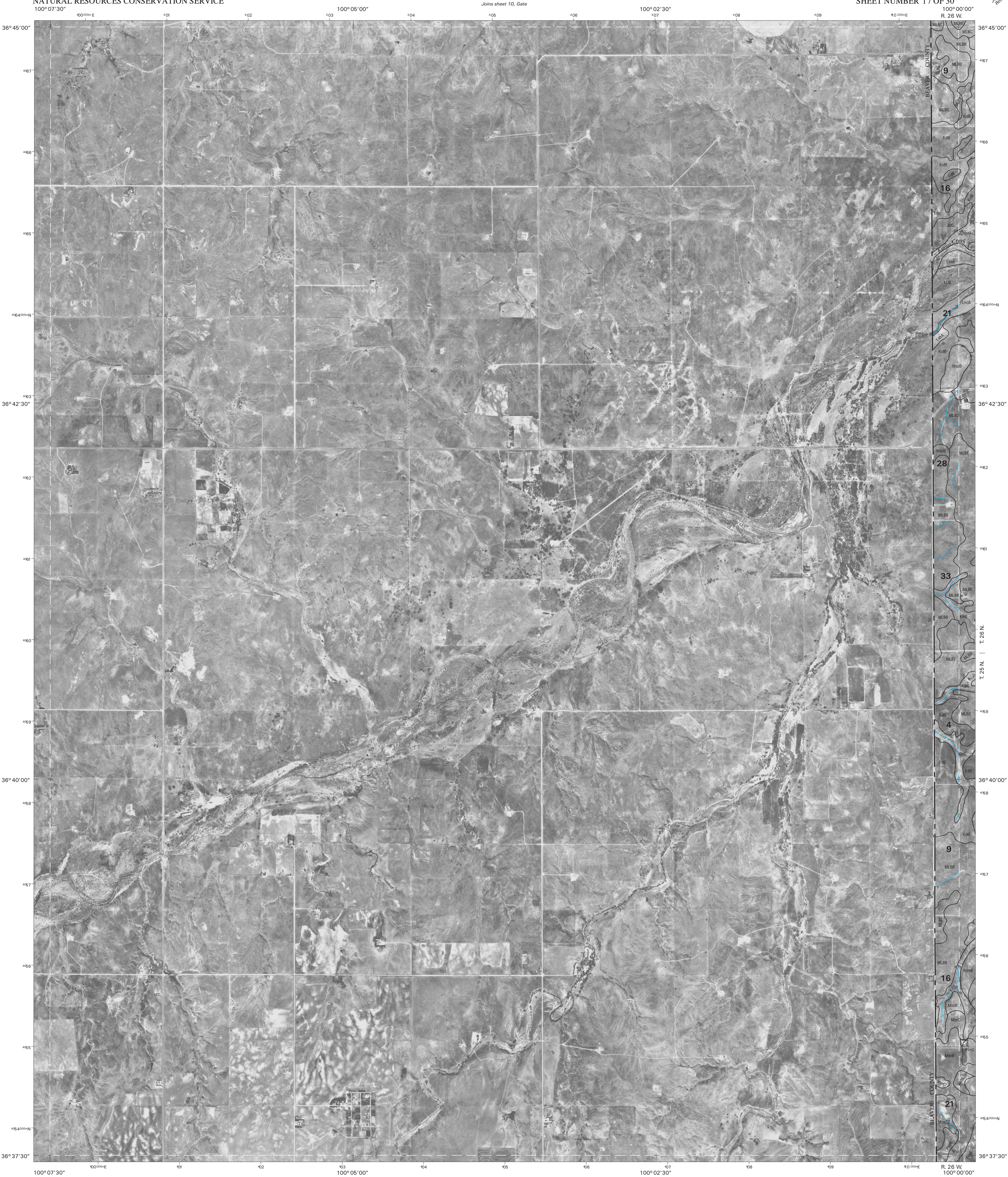
Joins sheet 23, Sleeping Bear Creek

SCALE 1:24000

SELMAN SE, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 16 OF 30

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.





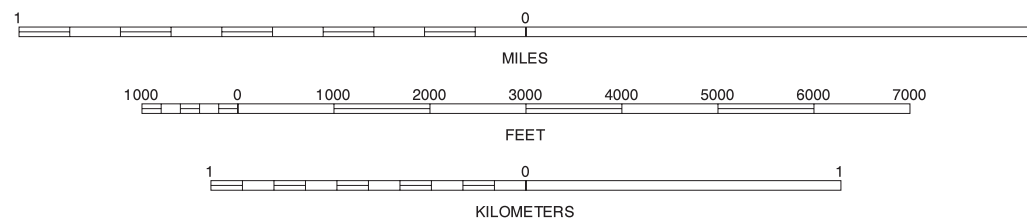
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1991 - 1998 aerial photography. PLSS was acquired from USGS and edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION



LOGAN NE, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 17 OF 30

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.

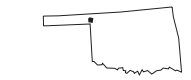




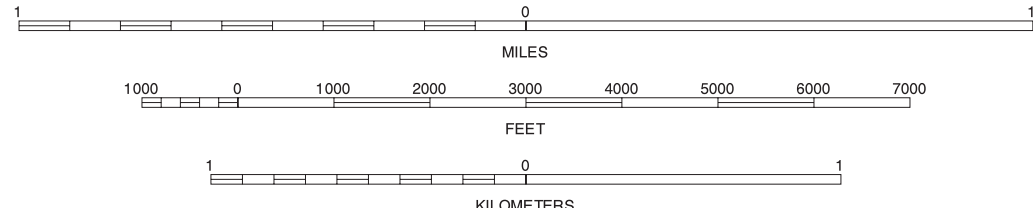
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NORTH



QUADRANGLE LOCATION



SCALE 1:24000

LAVERNE, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 18 OF 30

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.

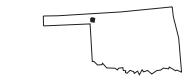




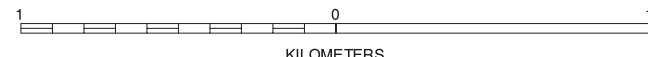
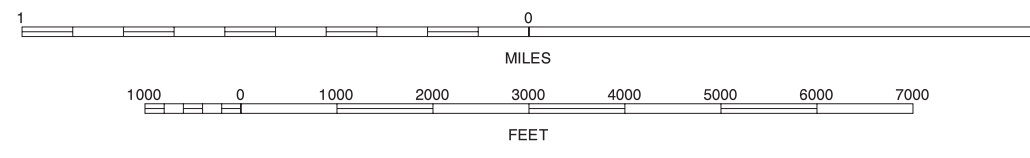
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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



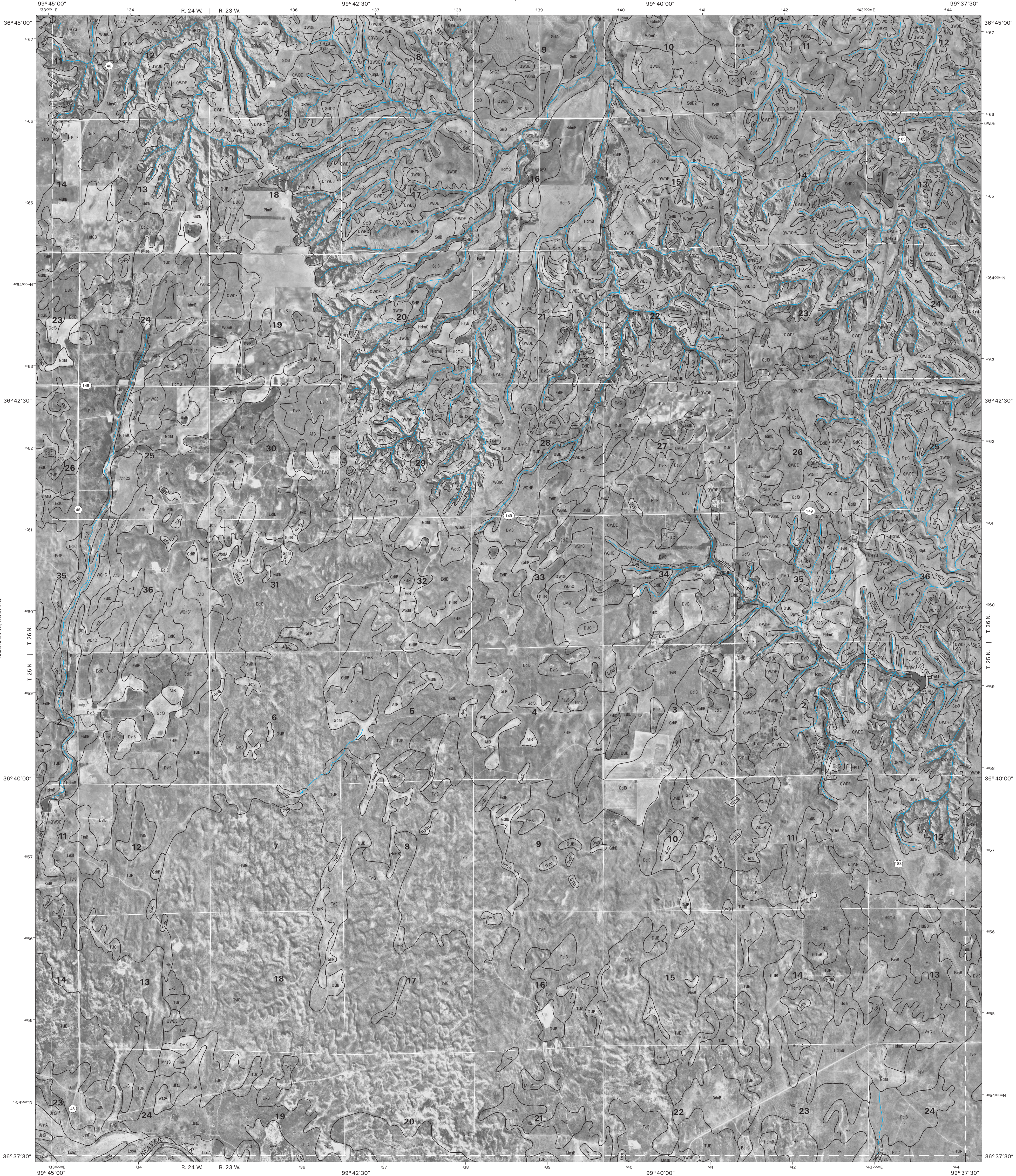
QUADRANGLE LOCATION



LAVERNE NE, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 19 OF 30

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.





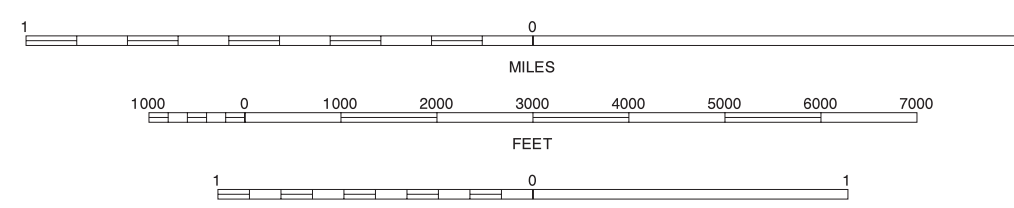
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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

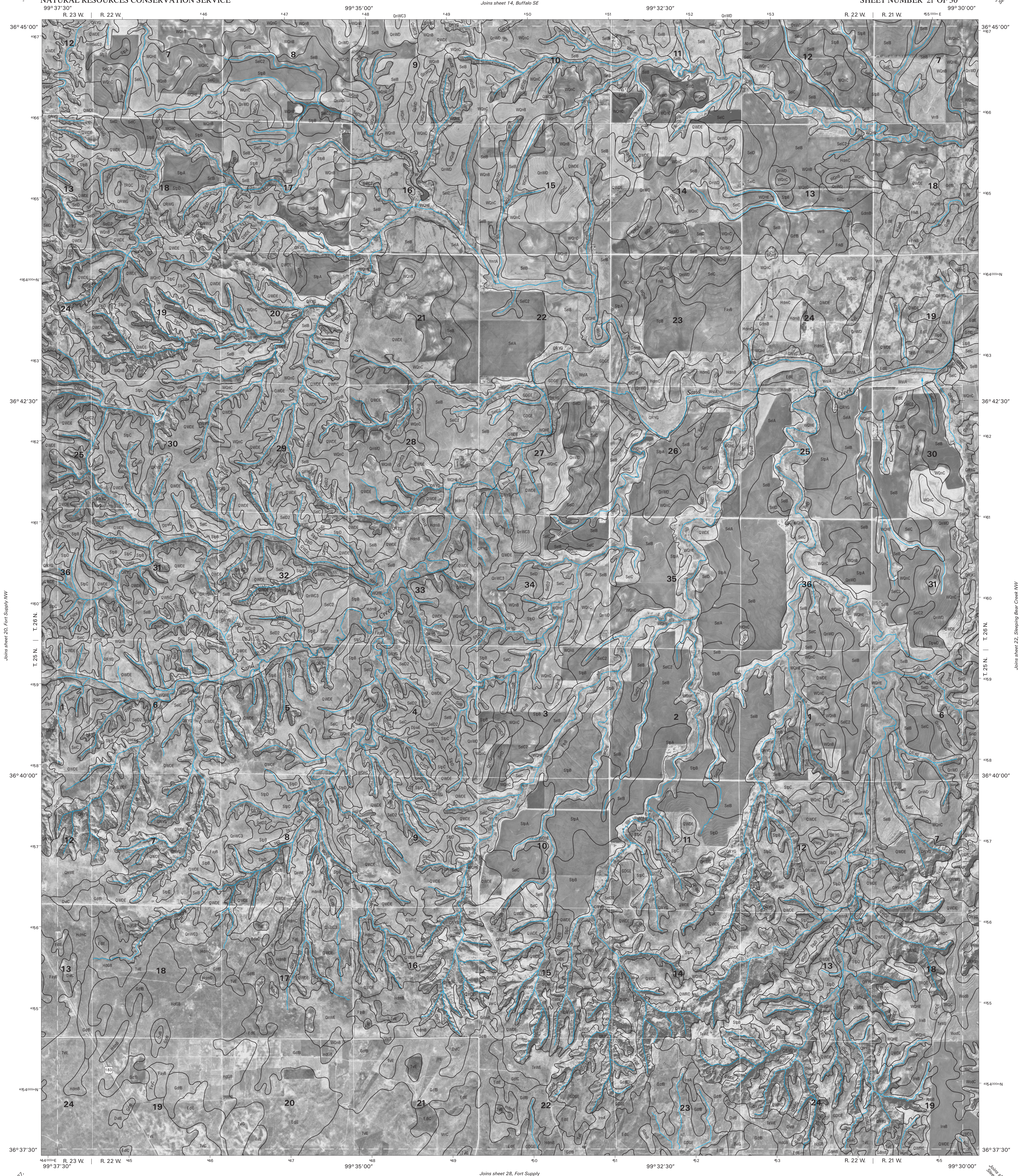


SCALE 1:24000

FORT SUPPLY NW, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 20 OF 30

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.

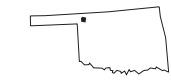




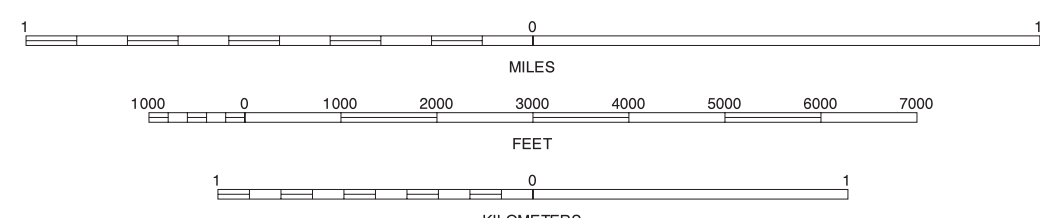
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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION



SCALE 1:24000

FORT SUPPLY NE, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 21 OF 30

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.

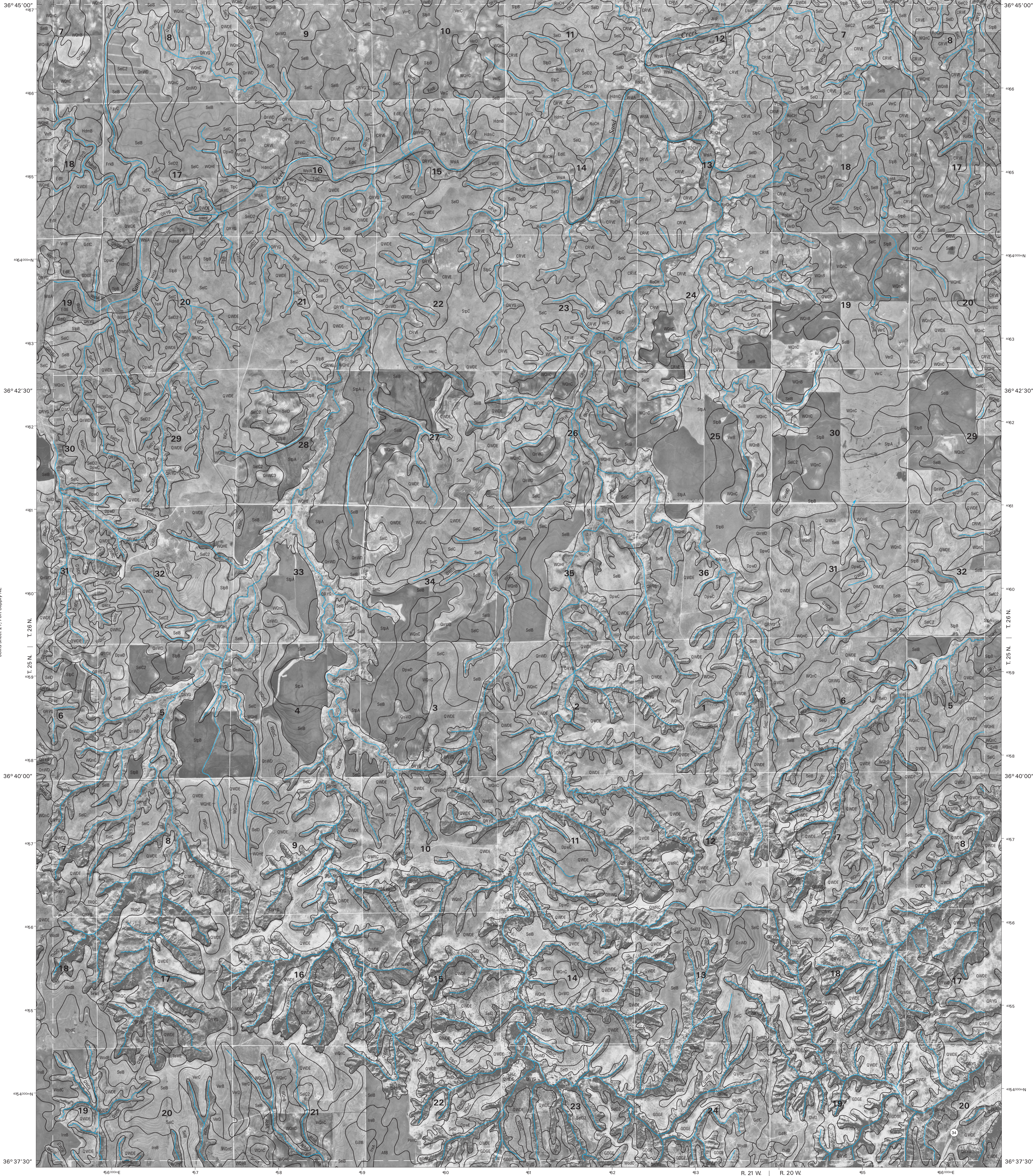
Joins sheet 20, Fort Supply NW

Joins sheet 22, Sheeping Bear Creek NW

Joins sheet 27,  
Mayes

Joins sheet 29,  
Sheeping Bear Creek SW





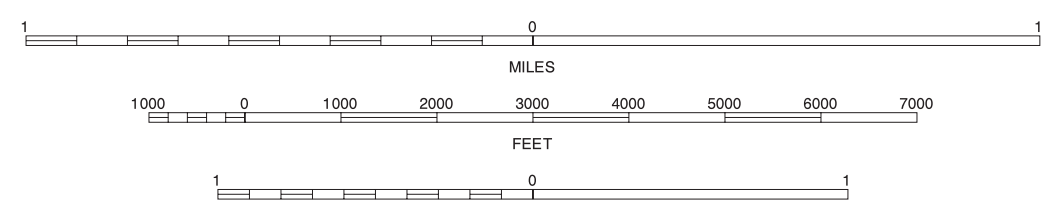
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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION



SCALE 1:24000

SLEEPING BEAR CREEK NW, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 22 OF 30

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.





ms sheet 29,  
Sleeping Bear Creek SW

NORTH

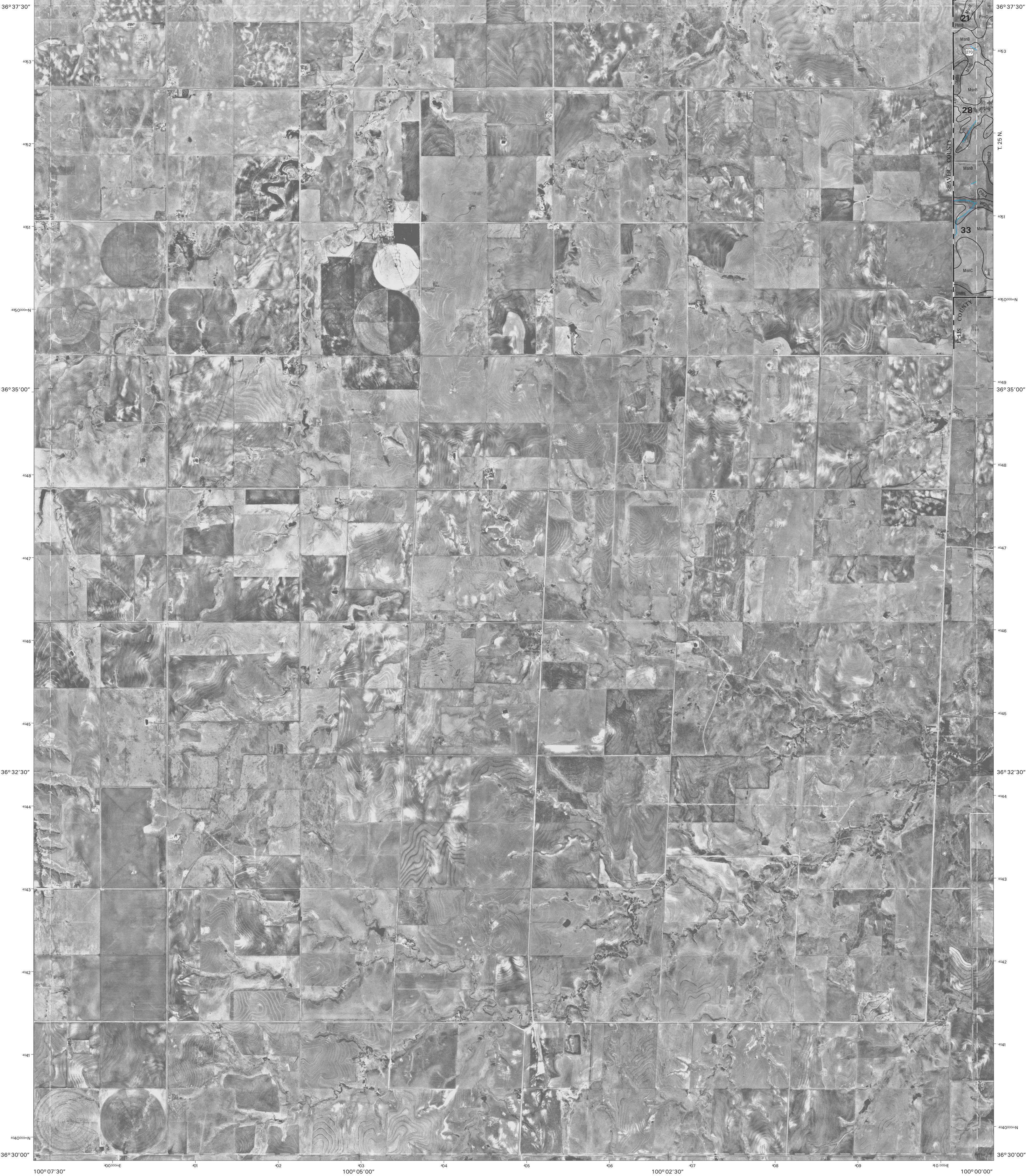


QUADRANGLE LOCATION



Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

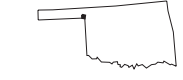




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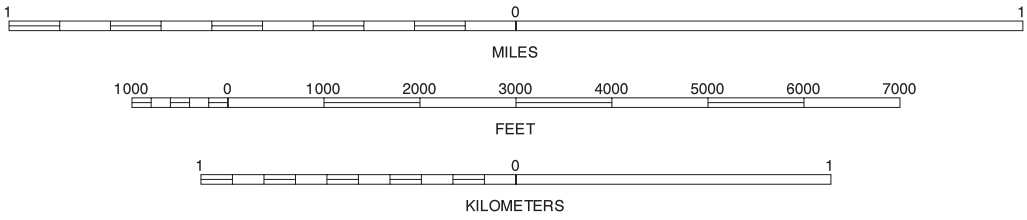
North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

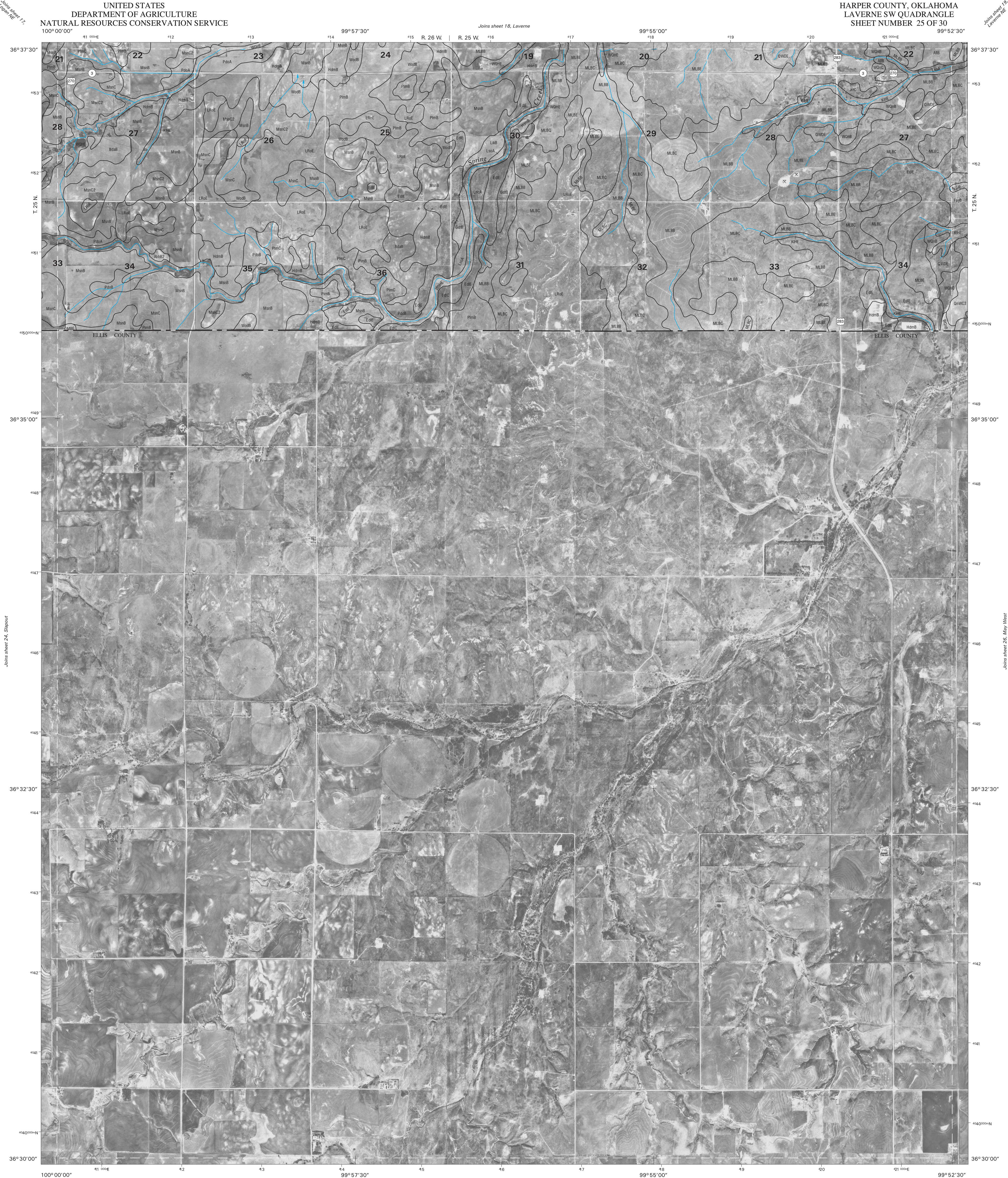
SCALE 1:24000



SLAPOUT, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 24 OF 30

Soil map delineations extending beyond the dashed white quadrangle neartline are for reference only and are included on adjacent map sheets.

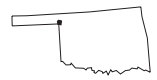




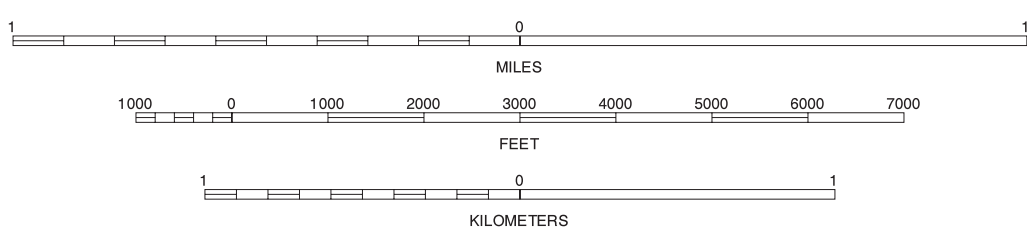
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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



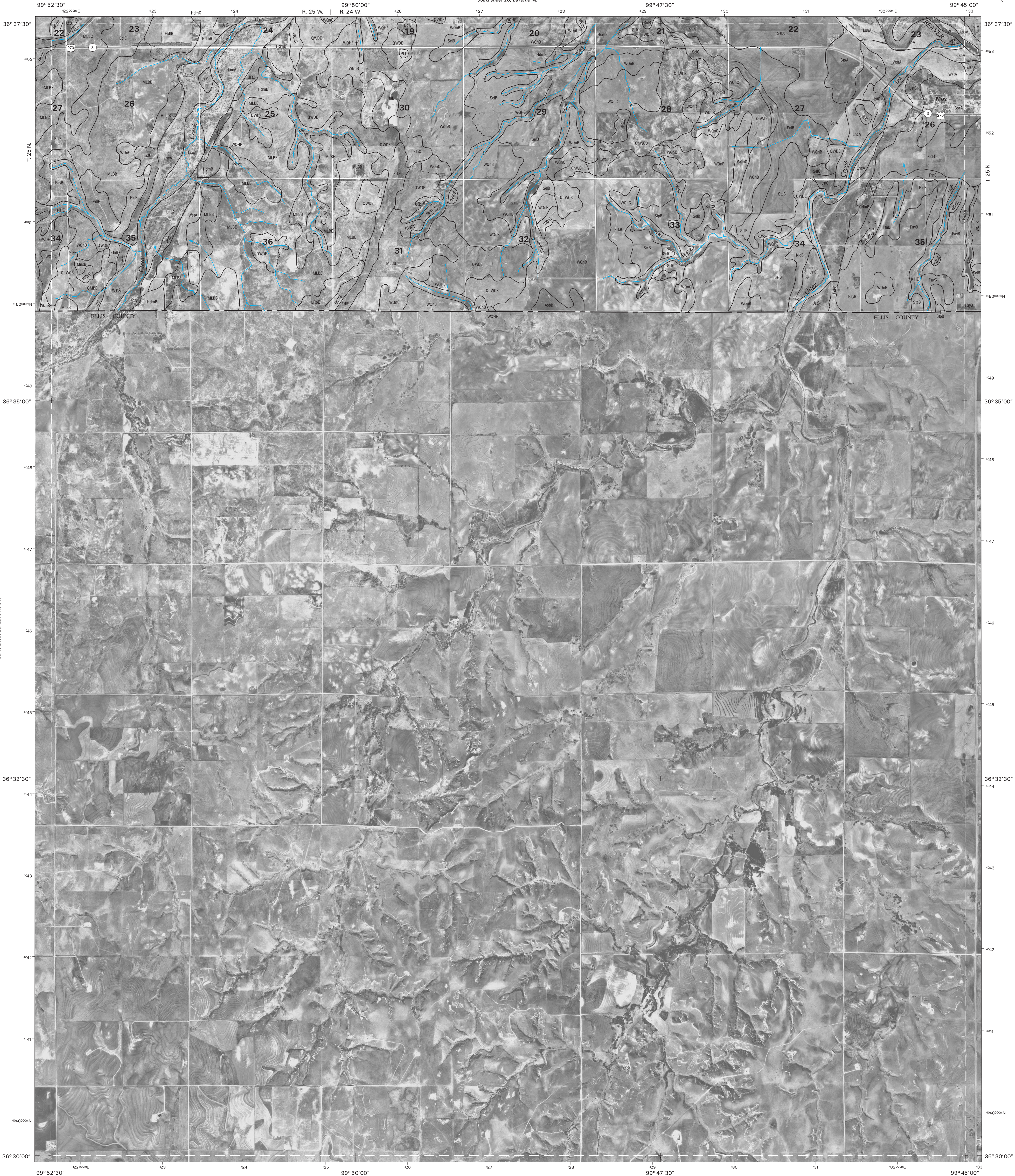
QUADRANGLE LOCATION



LAVERNE SW, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 25 OF 30

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.

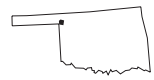




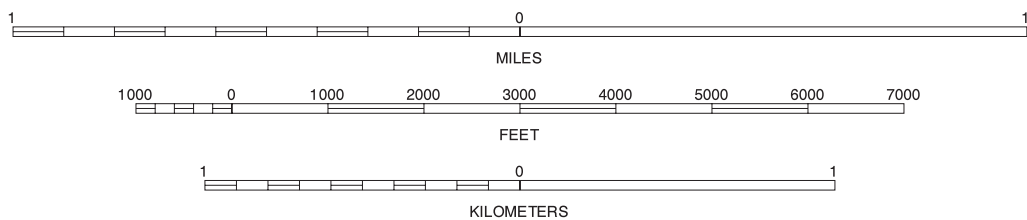
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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION



MAY WEST, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 26 OF 30

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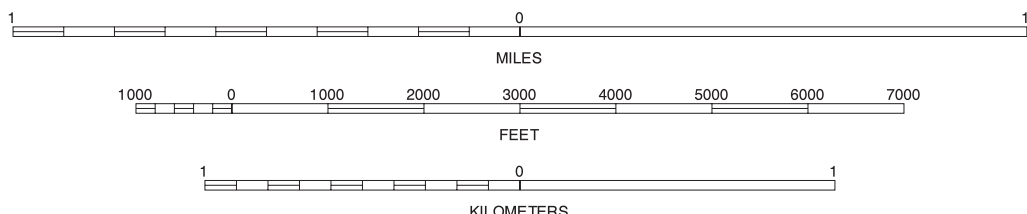
North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

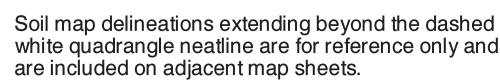
SCALE 1:24000



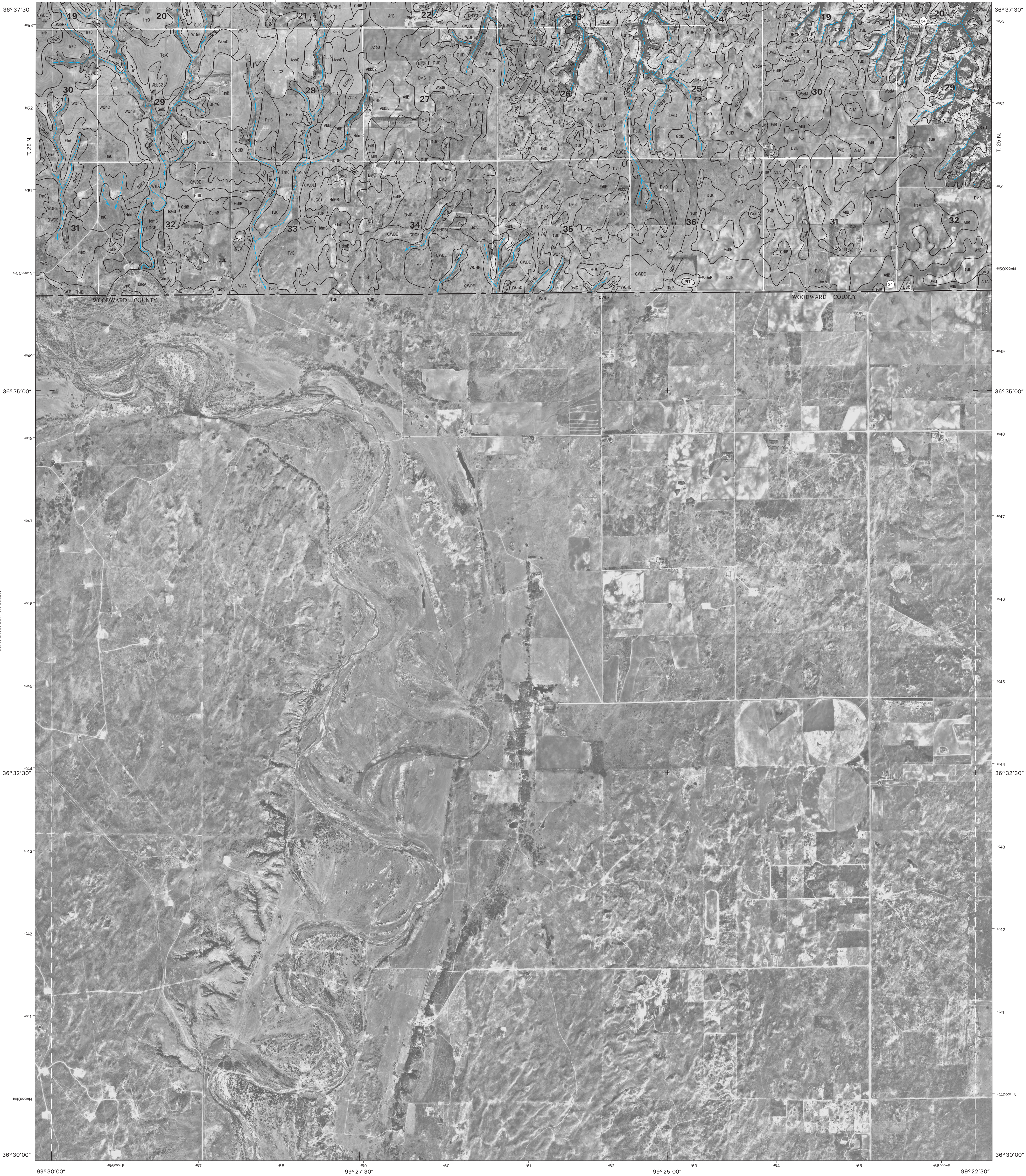
MAY EAST, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 27 OF 30

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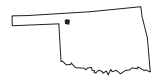




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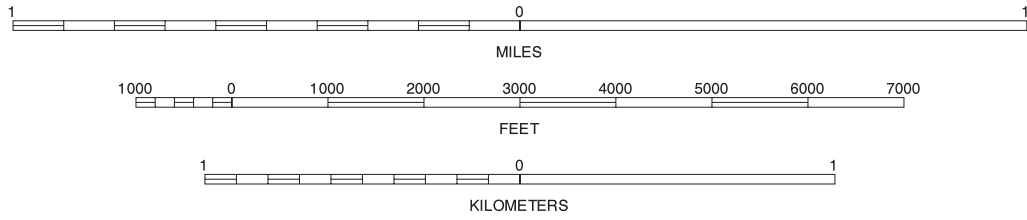
North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

SCALE 1:24000



SLEEPING BEAR CREEK SW, OKLAHOMA  
7.5 MINUTE SERIES  
SHEET NUMBER 29 OF 30

Soil map delineations extending beyond the dashed white quadrangle neartline are for reference only and are included on adjacent map sheets.

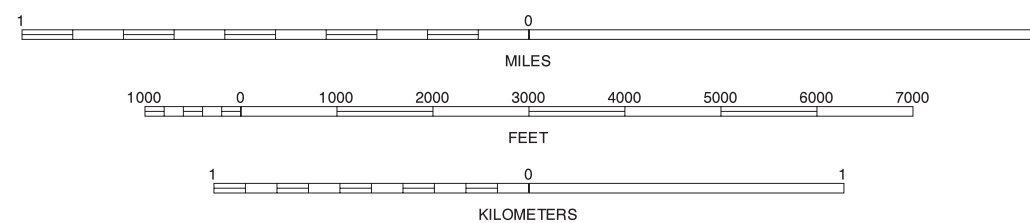




NORTH



SCALE 1:24000



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